



# ICEBALL FX Service Manual

Innovative Concepts in Entertainment  
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Monday through Friday 8:30 am to 6pm Eastern Standard Time

[www.icegame.com](http://www.icegame.com)

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## SAFETY AND WARNINGS BEFORE YOU BEGIN

WARNING: WHEN INSTALLING THIS GAME, A GROUNDED A.C. RECEPTACLE MUST BE USED. FAILURE TO DO SO COULD RESULT IN INJURY TO YOURSELF OR OTHERS. FAILURE TO USE A GROUNDED RECEPTACLE COULD ALSO CAUSE IMPROPER GAME OPERATION, OR DAMAGE TO THE ELECTRONICS.

**NOTE: THIS GAME IS INTENDED FOR INDOOR USE ONLY.**

DO NOT DEFEAT OR REMOVE THE GROUNDING PRONG ON THE POWER CORD FOR THE SAME REASON AS GIVEN ABOVE. USING AN IMPROPERLY GROUNDED GAME COULD VOID YOUR WARRANTY.

HAVE A QUALIFIED ELECTRICIAN CHECK YOUR A.C. RECEPTACLE TO BE SURE THE GROUND IS FUNCTIONING PROPERLY.

THIS GAME IS DESIGNED TO DISSIPATE STATIC ELECTRICITY THROUGH THE GROUNDING PLANE OF THE GAME. IF THE A.C. GROUND DOES NOT WORK, THE GAME COULD DISCHARGE STATIC ELECTRICITY THROUGH THE GAME CIRCUITRY, WHICH COULD CAUSE DAMAGE.

THE POWER SUPPLY IS NOT VOLTAGE ADJUSTABLE. TO OPERATE THE GAME AT VOLTAGES OTHER THAN THOSE IT WAS DESIGNED FOR. PLEASE CONTACT OUR SERVICE DEPARTMENT FOR VOLTAGE CONVERSION INFORMATION.

### WARNING

DO NOT remove any of the components on the main board (e.g. compact flash and EPROMS) while the game is powered on. This may cause permanent damage to the parts and the main board. Removing any main board component part while powered on will void the warranty.

ALWAYS REMOVE POWER TO THE GAME, BEFORE ATTEMPTING ANY SERVICE, UNLESS NEEDED FOR SPECIFIC TESTING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SERIOUS INJURY TO YOURSELF OR OTHERS.

THIS GAME IS NOT SUITABLE FOR INSTALLATION IN AN AREA WHERE A WATER JET COULD BE USED.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

The game's foot print is 120" x 30" x 84".

### AC Power Information

The games main fuse is accessed through the front of the cabinet, at the right. Above the power cord is a small panel that contains the main fuse.

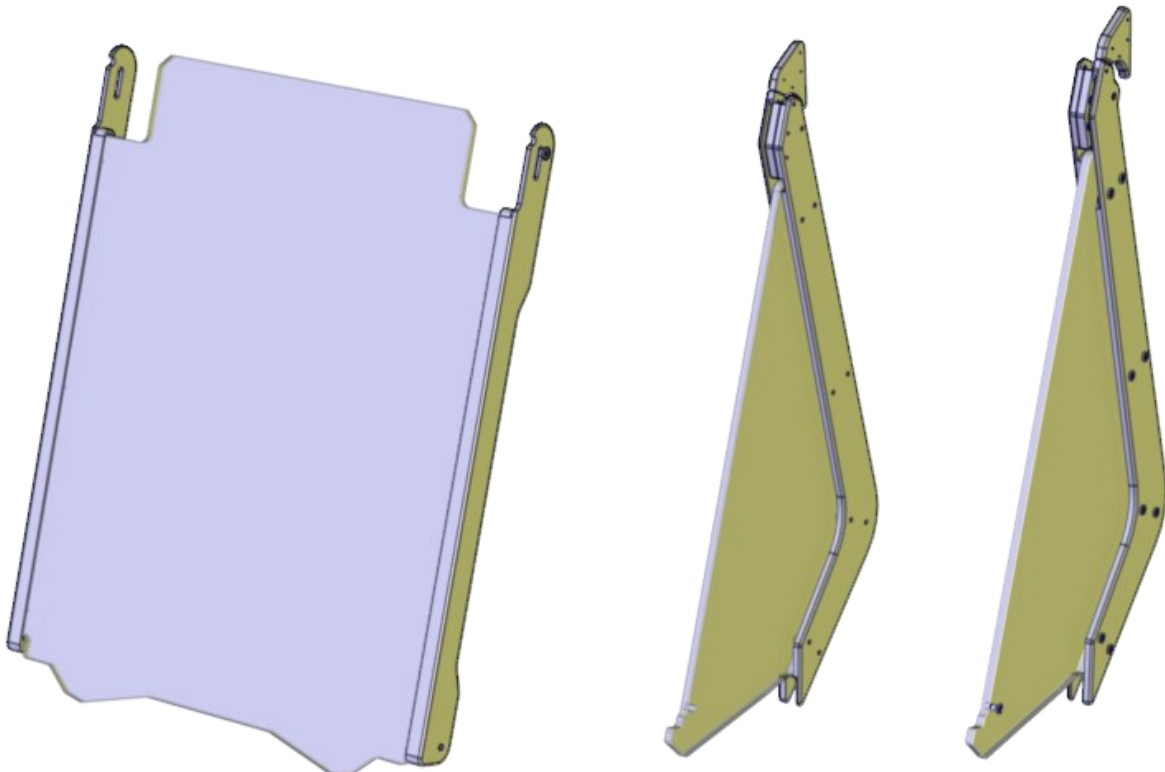
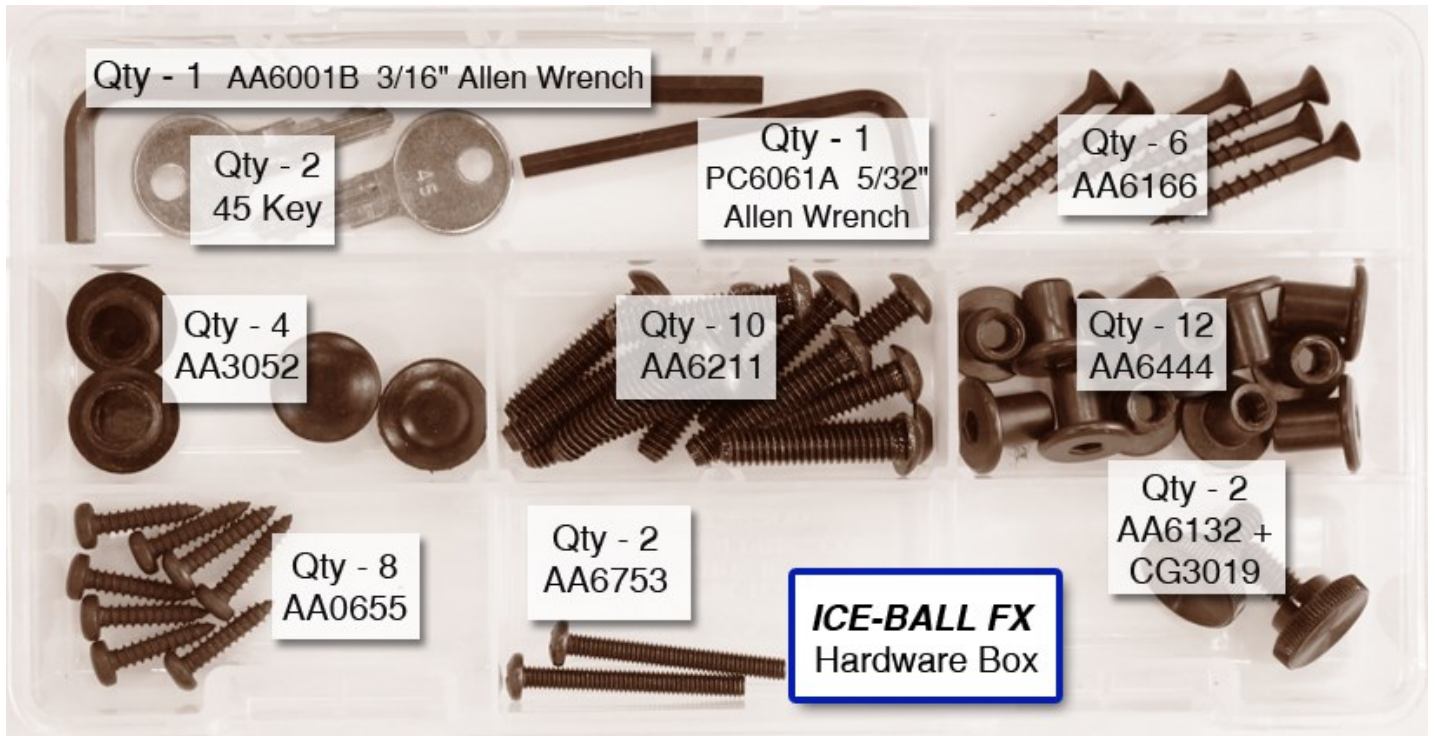
The value of the fuse for 120 volt users is 3 AMPS at 250Volt type slow blow.  
The value of the fuse for 230 users is 3 AMPS at 250Volt type slow blow.



## Before you Begin

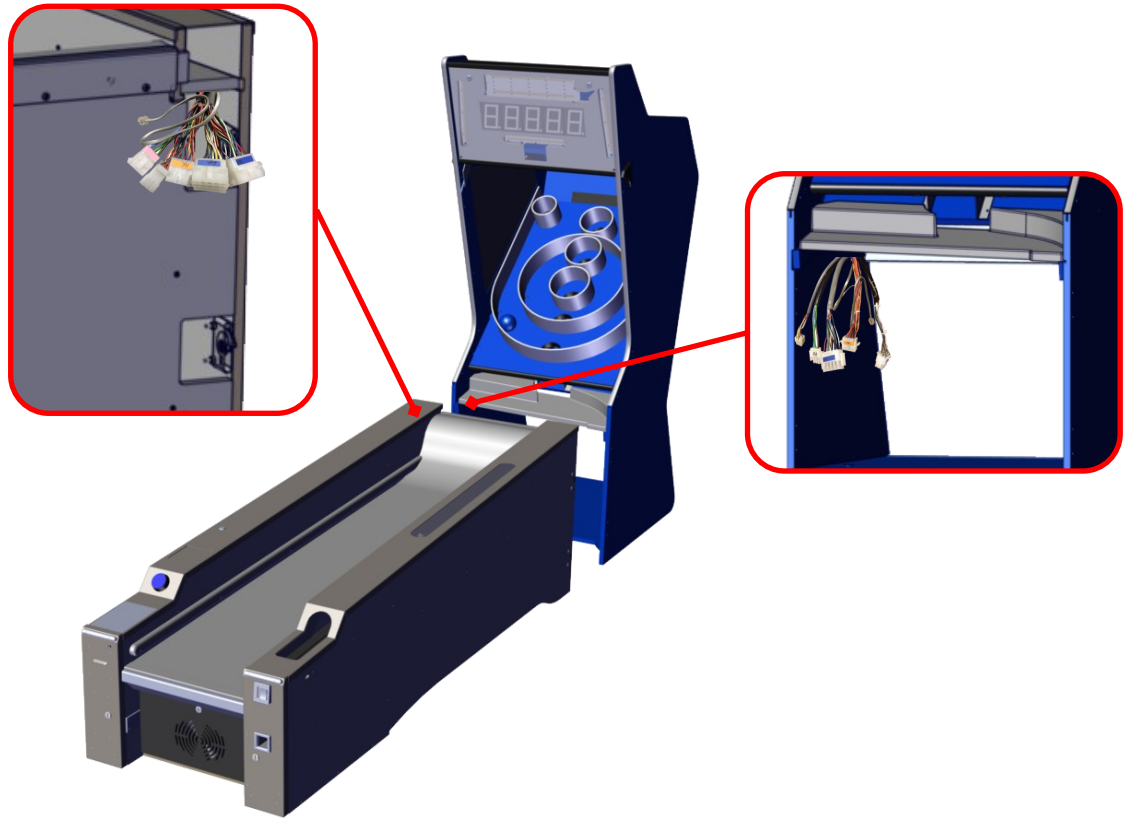
Before you begin to assemble your game locate and review this and the next page for the parts included with your game.

If any parts are missing please contact ICE Service at (716) 759-0360 Monday through Friday 9am to 6pm Eastern Standard.



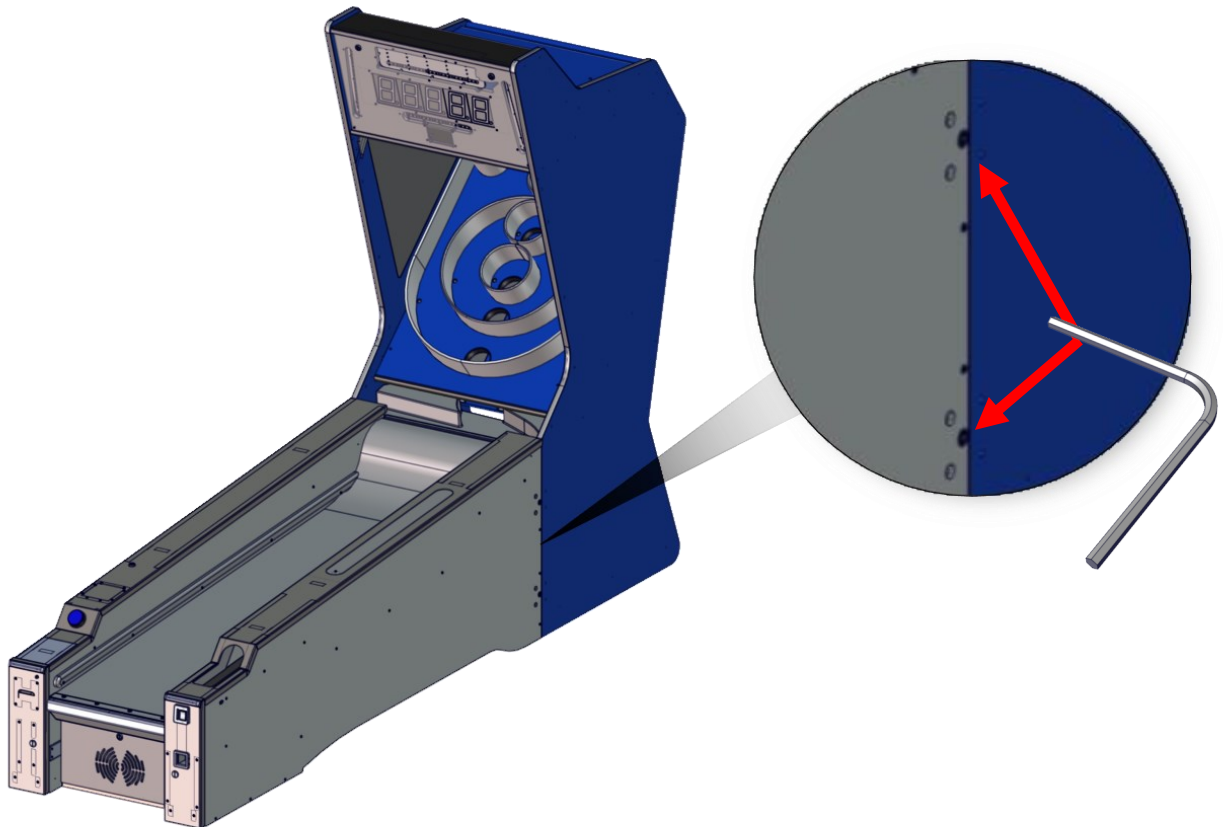


## STEP 1:



Position the front and back cabinets leaving a space to connect the wire harnesses. Each of the harnesses are color coded. Attach the phone cords together using the provided coupler.

## STEP 2:



Using the provided latch tool and on both sides of the cabinet insert the tool into the latch openings and turn clockwise until the cabinet pulls together and the locks.

**STEP 3:**

Unlock coin door and slide door open.



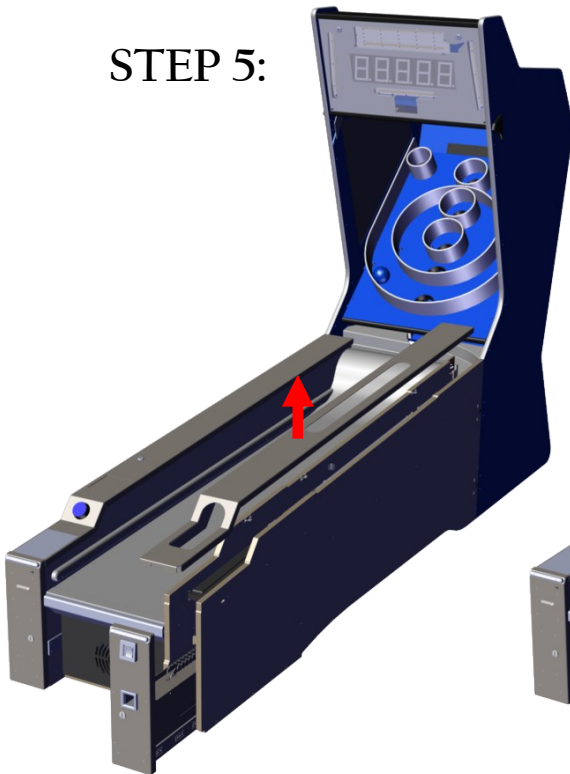
**STEP 4:**

Slide Ball rail cover forward.



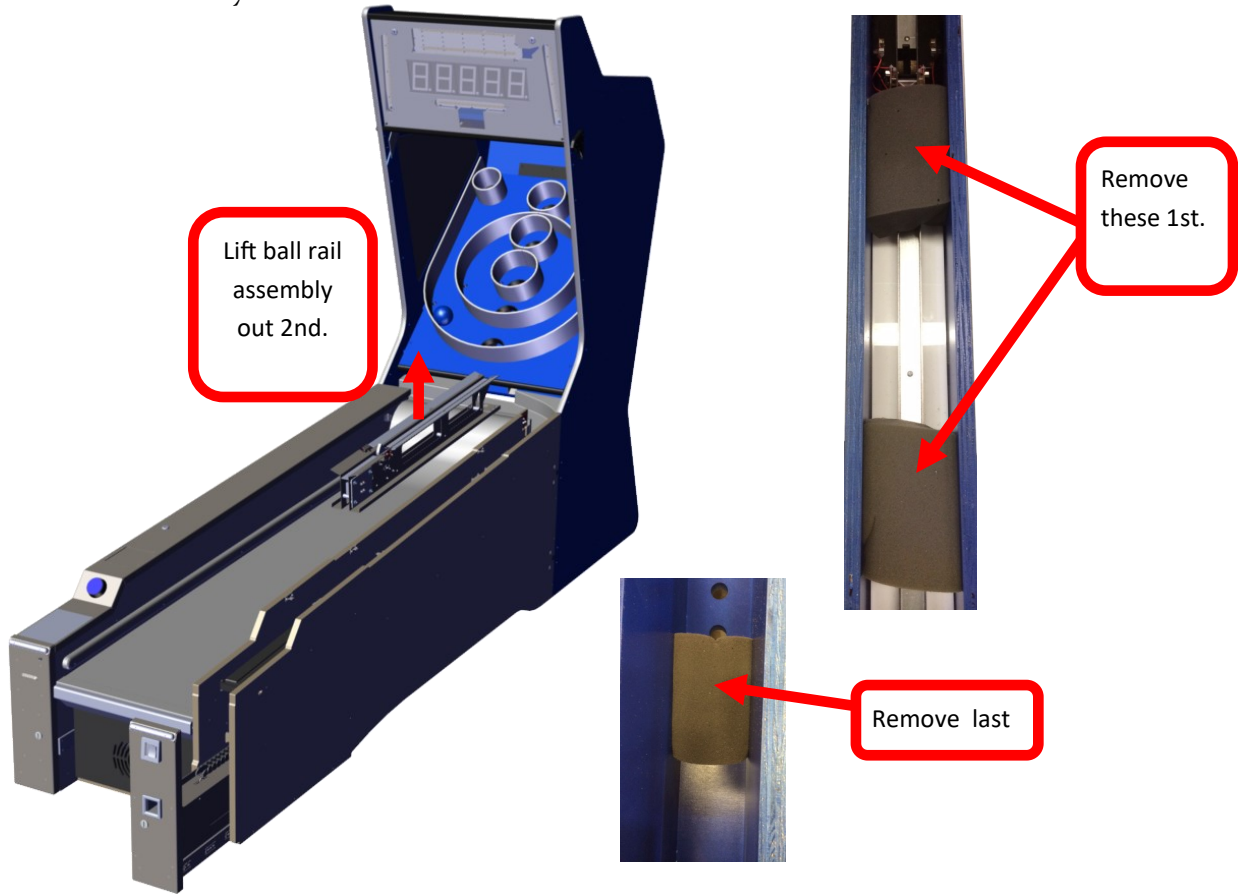
**STEP 5:**

Lift Ball rail cover up and put aside.



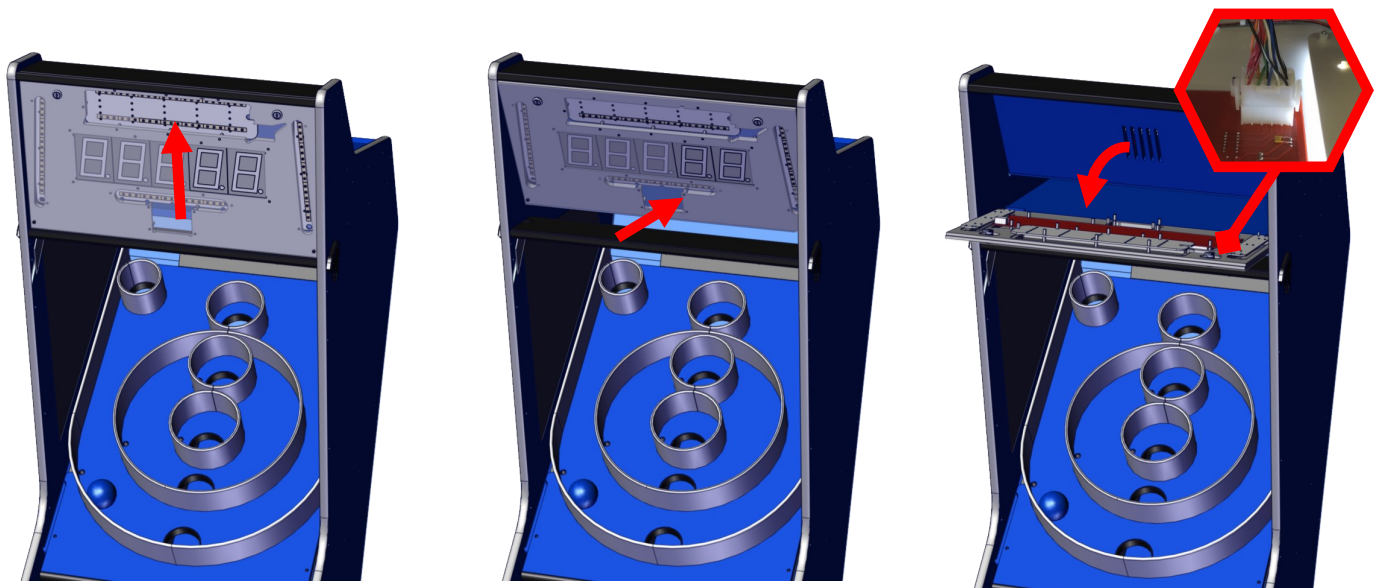
## STEP 6:

Remove the two foam packs on the top and lift ball rail assembly up and out. Remove the foam pack beneath. Re-install ball rail assembly.



## STEP 7:

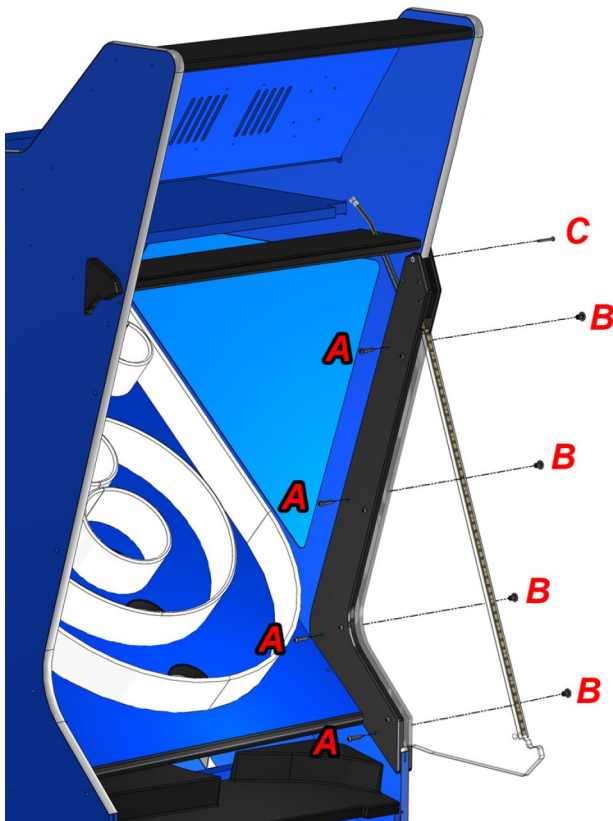
Unlock both top locks, lift up, push the bottom in slightly, and lower the top down, unplug harness and lift out.








## Step 8:

Attach the right glass assembly around the side panel. The right glass assembly is marked “RT” for right and “LT” for left. Attach the glass assembly using hat nut on the outside and an Allen bolt on the inside. Run the LED harness through the side channels. Repeat for the left side.



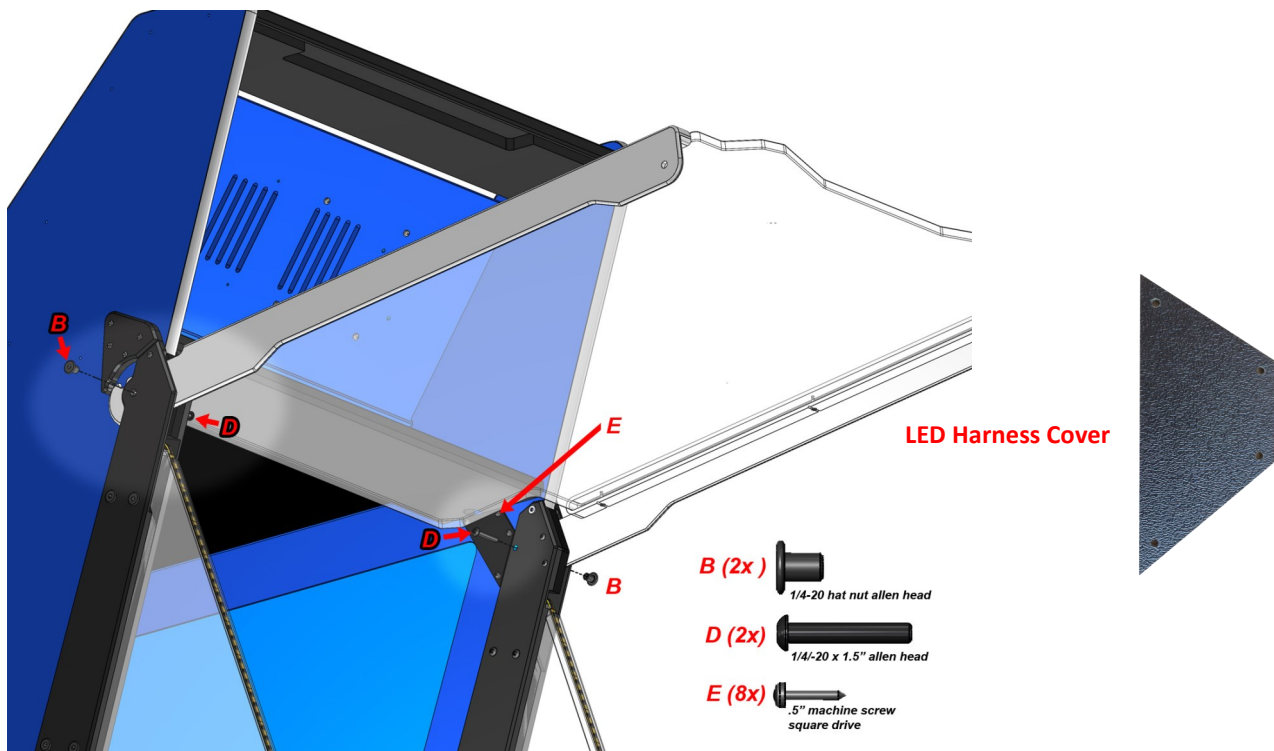
Loosen the bolts on the side assemblies first before attaching to the cabinet. It will allow you to align with bolts and hat nuts better!




- A (8x)**  1/4-20 x 1.125" allen head
- B (8x)**  1/4-20 hat nut allen head
- C (2x)**  8/32 x 1.5" phillips head



## Step 9:

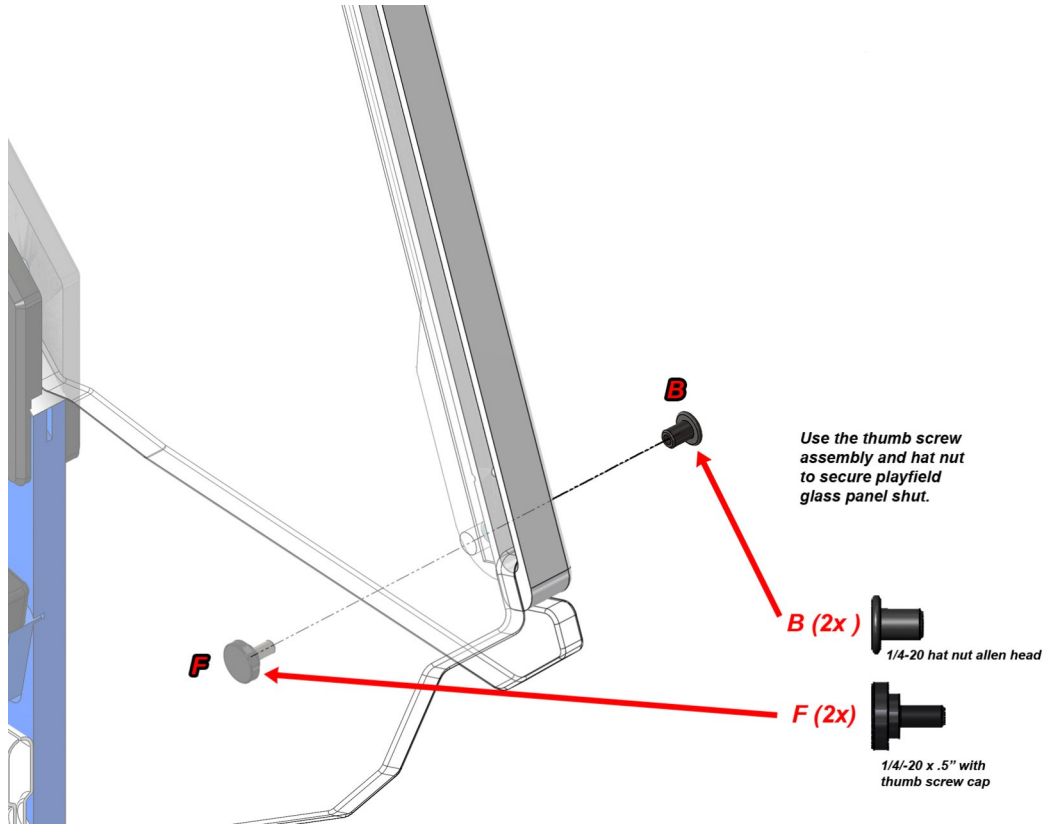
Slide the playfield glass assembly wings through the outside top of the side glass assemblies. Attach a hat nut [B] to the outside and a bolt [D] on the inside. Attach the LED harness covers using the 1/2" 655 screws [E].



- B (2x)**  1/4-20 hat nut allen head
- D (2x)**  1/4-20 x 1.5" allen head
- E (8x)**  1/2" machine screw square drive

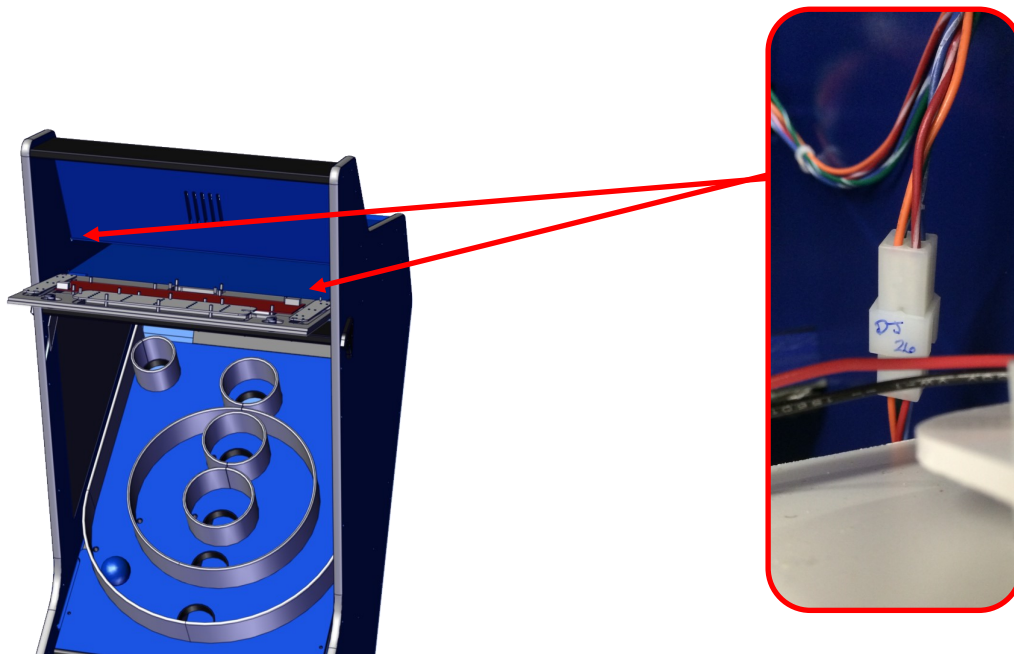
## STEP 10

Secure the Playfield cover glass using provided hat nuts and thumb screws. See below.



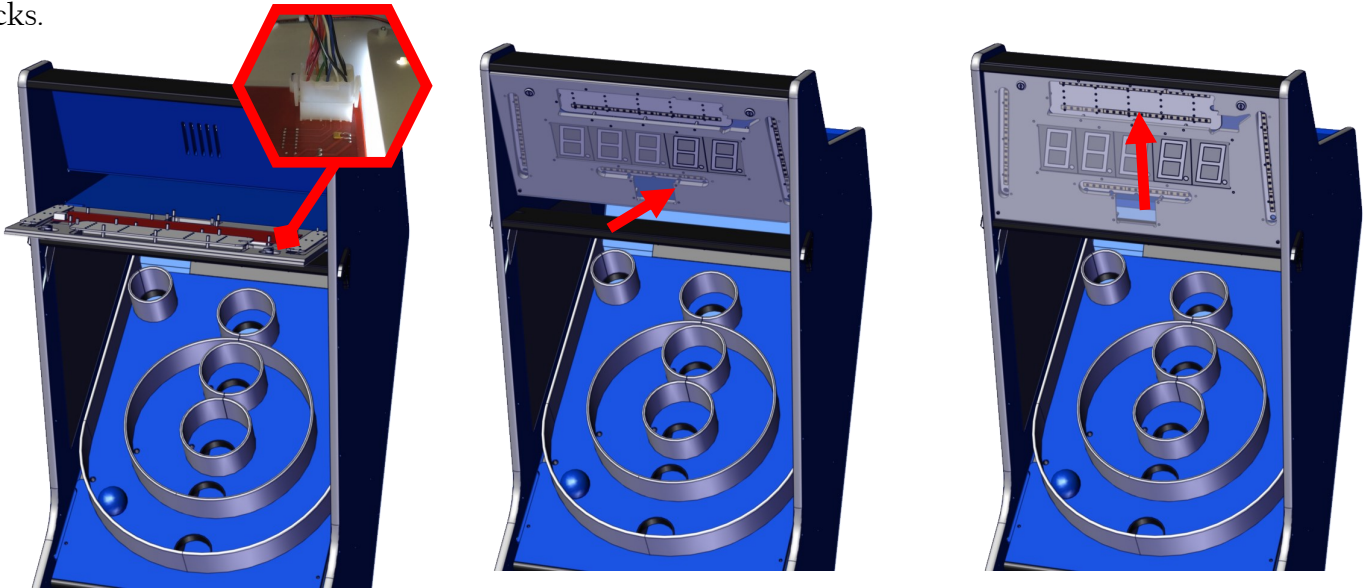
## STEP 11

Connect the LED harnesses on both sides.



## STEP 12:

Lay the upper display assembly on its front and plug the harness back in. Tilt the bottom toward the back and then insert the top into the cabinet's upper groove. Slide the display down and relock the two locks.



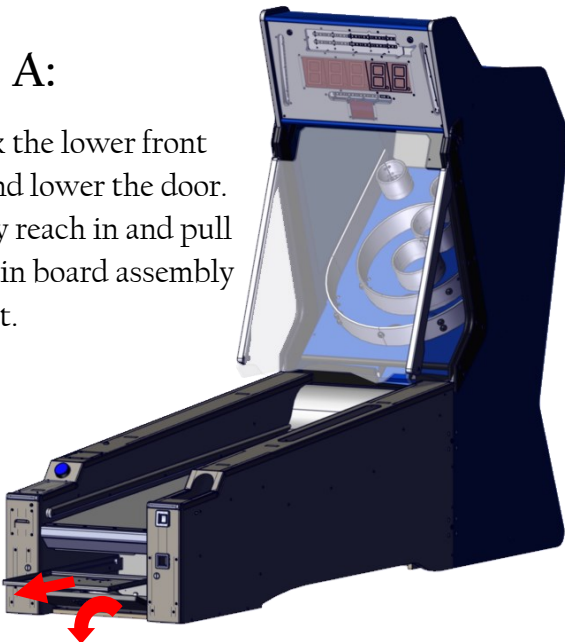
## FINAL STEP

Your game is now assembled. If you are planning on using more than one game then repeat the previous steps for each game. See the section “Linking Multiple Games” for instructions on how to link them together.

If you are using only one game at your location you will need to verify that the Station ID has been set to 1. Failure to do so will result in no LED lighting effects. Follow the below sub-steps to confirm. It is now time to program your game to your desired settings and install the score plaque. See the section “Program Settings” for further information.

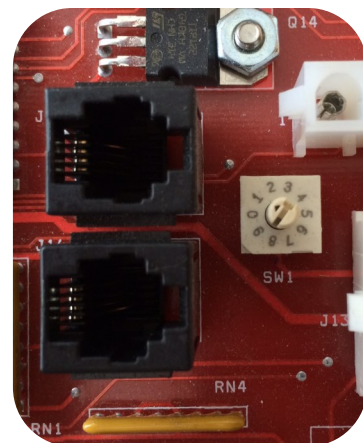
### Step A:

Unlock the lower front door and lower the door. Slightly reach in and pull the Main board assembly tray out.



### Step B:

Locate the rotary dial switch labeled SW1 next to the phone linking connectors and turn the dial so that the black arrow is pointed to the position 1.



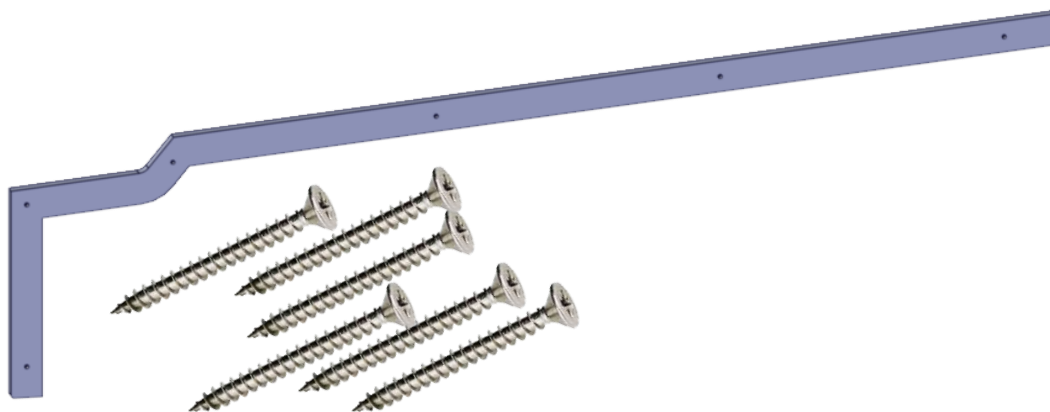
## Linking Multiple Games

Your ICEBALL FX alley roller game can be linked with other ICEBALL FX alley roller games. Up to nine games can be linked together. Each game must have its options set up the same. The linking of the games will only synchronize the LED lighting effects. A Mega Marquee is used to provide a Super Bonus which is set and controlled by the Mega Marquee.

To link your games together, each game must be set to a **different ID number and must start at Station ID 1**. Follow the next few steps to properly link your games together.

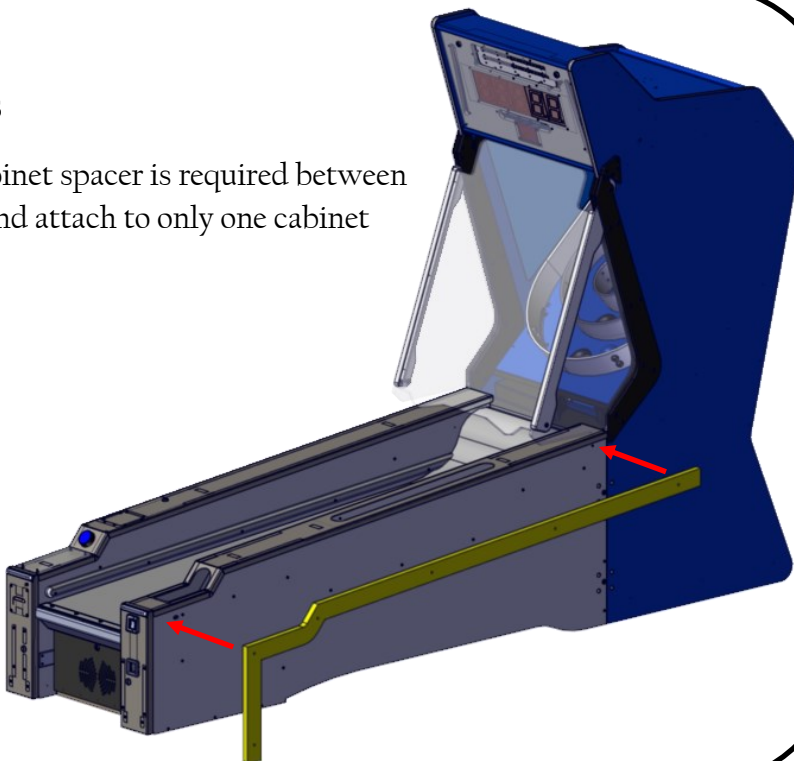
### STEP 1: Locate the Cabinet Spacer and mounting hardware

Each ICEBALL FX alley roller game shipped includes one cabinet spacer and its mounting hardware. Locate your cabinet spacer and six 1½" wood screws.



### STEP 2: Attach Cabinet Spacers

For each game that is placed side to side a Cabinet spacer is required between the two games. Position the Cabinet Spacer and attach to only one cabinet side using the six 1½" wood screws.



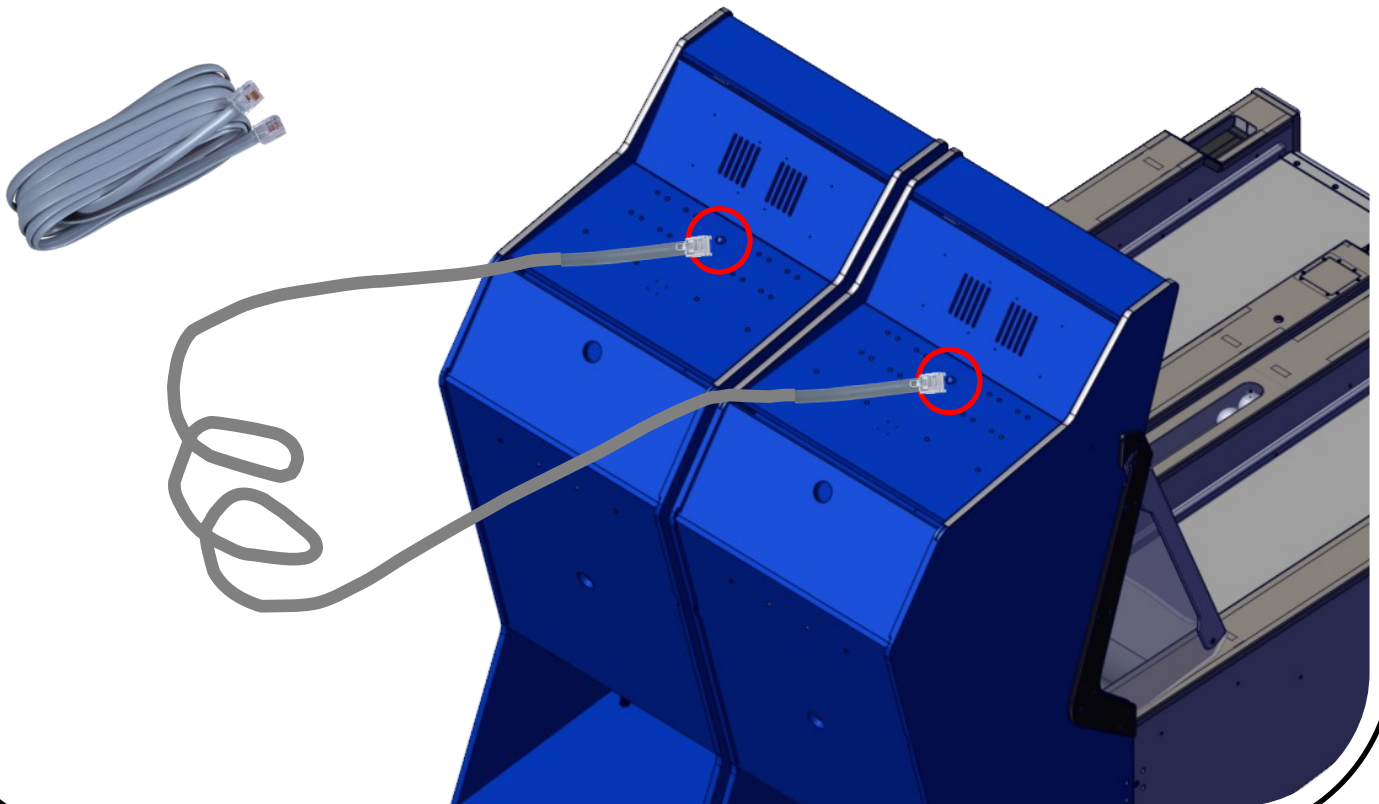
### STEP 3: Position

Slide the two games together as shown. If more games are desired to be linked, repeat step 2. Only install a Cabinet Spacer between games and not at the two ends. Use only one Cabinet Spacer between games.



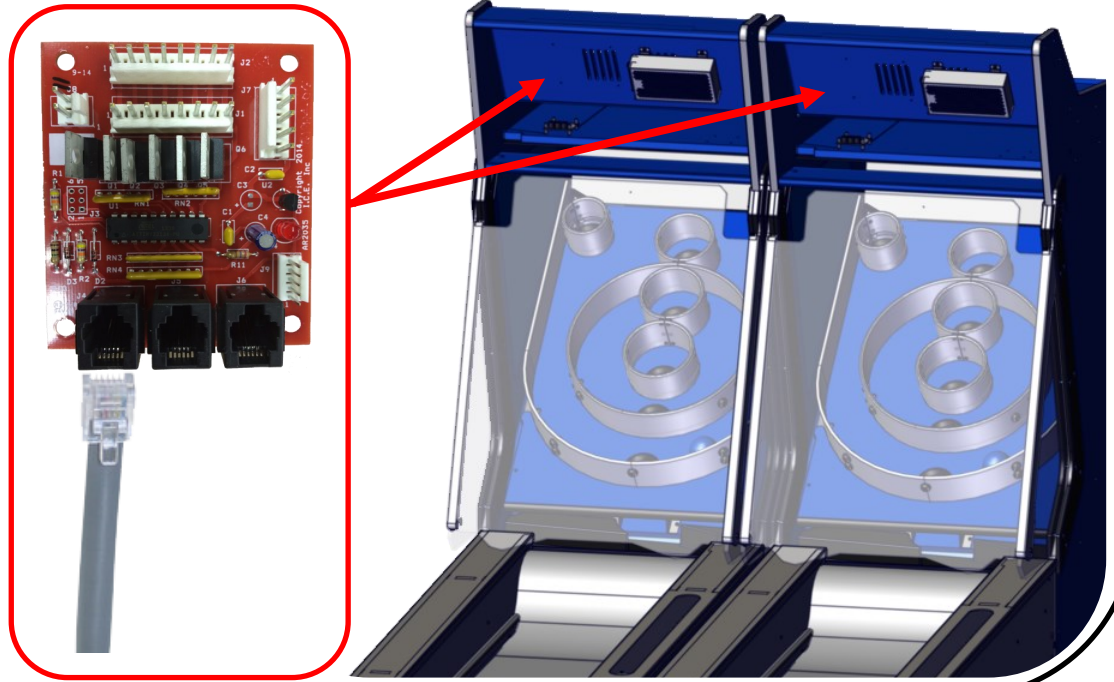
### STEP 4: Phone cord linking cable

From the back of the game and using one supplied 14' phone cord per paired game, insert each end of the cord into the upper hole showed below.



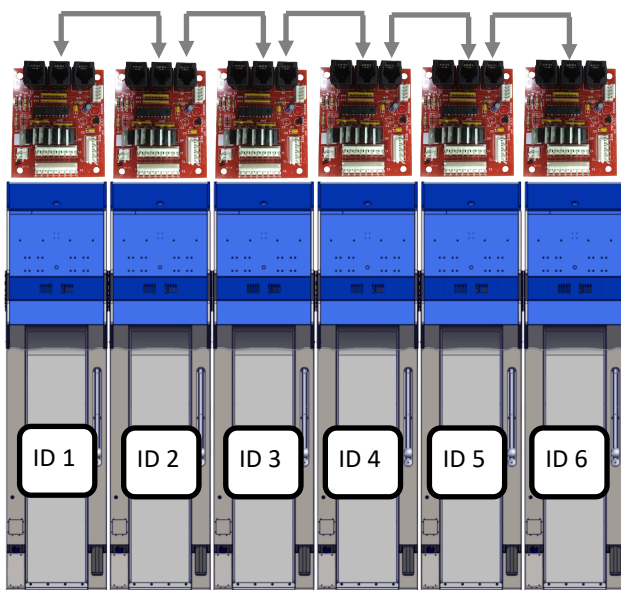
## STEP 5: RGB Board Connection

Open the upper Display as described in step 7 and connect the Linking Phone Cord to any connector not used. It makes no difference which Phone connector on the RGB LED board you use.

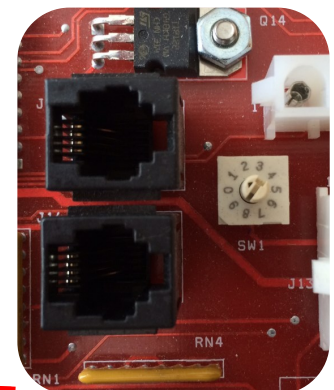


Each game must be set to a different ID station!

**One game MUST BE set to ID Station 1.**



Unlock the lower front door and lower the door. Slightly reach in and pull the Main board assembly tray out. Locate the rotary dial switch labeled SW1 next to the phone linking connectors and turn the dial so that the black arrow is pointed to a different position for each game.

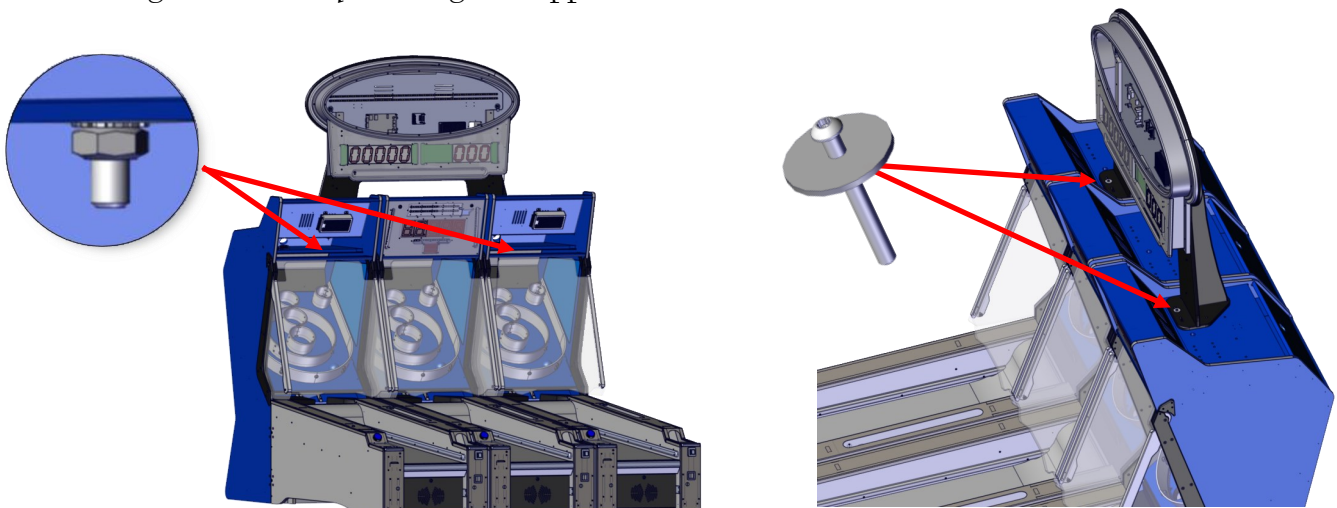


# Mega Bonus Marquee Install

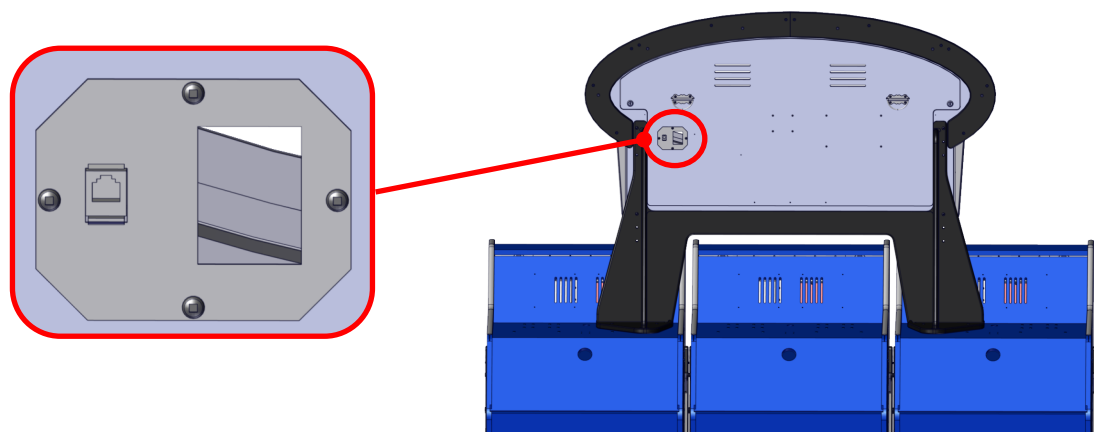
The Mega Bonus Marquee can be mounted either between two games or three. It is recommended to mount the Mega Bonus Marquee centered to the games. So if an even number of games are being used, you would install the Mega Bonus Marquee between two games. If an odd number of games are being used, you would install the Mega Bonus Marquee between three games. For example if you had four games and installed the Mega Bonus Marquee you would install the marquee between games two and three. If you had five games and installed the Mega Marquee you would install the marquee between games two and four. The hardware to mount the marquee was used to mount the marquee to the pallet it was shipped on.



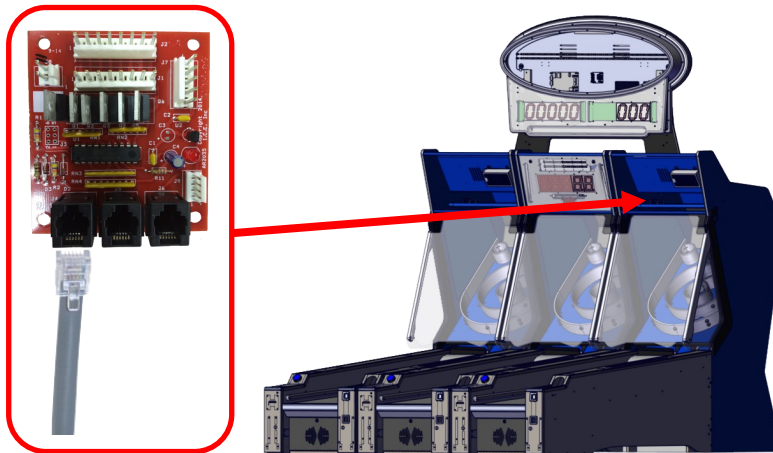
Attach the Mega Bonus Marquee using the supplied hardware as shown.



Plug both the AC cord and Phone Linking Cable into the back of the Mega Bonus Marquee.



Open the upper Display as described in step 7 and connect the Mega Bonus Linking Phone Cord to any connector not used. It makes no difference which Phone connector on the RGB LED board you use.



## Mega Bonus Marquee Programming 3.105 (5 digit display)

The Mega Bonus Marquee can be programmed remotely by game ID 1 and only during the power on sequence. To program your marquee power on the Mega Bonus Marquee first. Now power on the games and when the score display shows dashes, press the “PROGRAM” button. If the games and marquee are already on, press the “PROGRAM” button, then press the “PROGRAM” button again, and when the score display shows dashes, press the “PROGRAM” button one more time.

The ball display on the game will show you which option you are on. The score display shows that option's value. Pressing the “SELECT” button will save the current value and advance to the next option. Using the “UP” and “DOWN” buttons will increase or decrease the options' value. **Once you have changed an option's value, you have to press the “SELECT” button in order to save that change. Failure to do so will result in that option reverting back to whatever the value was before you changed it.**

**Option 0: Default = 50,000 ; Min = 25,000 ; Max = 99,000 ; Increments by 1000**

*This value tells the marquee what score to start with. The default is 50,000 and can be up to 99,000.*

**Option 1: Default = 100 ; Min = 25 ; Max = 5,000 ; Increments by 25**

*This value tells the marquee how many tickets to start with. The default is 100 and can be set to 5,000.*

**Option 2: Default = 1 ; Min = 1 ; Max = 100 ; Increments by 1**

*This value tells the marquee how many games before incrementing the tickets. Default is 1.*

**Option 3: Default = 1 ; Min = 1 ; Max = 100 ; Increments by 1**

*This value tells the marquee how many games before taking 100 points off the score. Default is 1.*

**Option 4: Default = 500 ; Min = 25 ; Max = 5,000 ; Increments by 25**

*This value sets the maximum amount of tickets it can pay. Default value is 500 and can be set up to 5,000.*

**Option 5: Default = 0 ; Min = 0 ; Max = 10 ; Increments by 1**

*This value tells the marquee how many tickets to add when incrementing.*

For Example:

When the player finishes their game if the score is equal or less than the score shown on the marquee it will add one ticket (if option 2 is set to 1 and option 5 is set to 1) to the ticket win and subtract 100 points off the score to beat (if option 3 is set to 1). When the player beats the score, the marquee will revert to the values stored in option 0 and 1. Option 4 will limit the maximum amount the tickets to win can go.



## Mega Bonus Marquee Programming 3.103 (3 digit display)

The Mega Bonus Marquee can be programmed remotely by game ID 1 and only during the power on sequence. To program your marquee power on the Mega Bonus Marquee first. Now power on the games and when the score display shows dashes, press the “PROGRAM” button. If the games and marquee are already on, press the “PROGRAM” button, then press the “PROGRAM” button again, and when the score display shows dashes, press the “PROGRAM” button one more time.

The ball display on the game will show you which option you are on. The score display shows that option’s value. Pressing the “SELECT” button will save the current value and advance to the next option. Using the “UP” and “DOWN” buttons will increase or decrease the options’ value. **Once you have changed an option’s value, you have to press the “SELECT” button in order to save that change. Failure to do so will result in that option reverting back to whatever the value was before you changed it.**

**Option 0: Default = 50 ; Min = 25 ; Max = 99 ; Increments by 1000**

*This value tells the marquee what score to start with. The default is 50,000 and can be up to 99,000.*

**Option 1: Default = 100 ; Min = 25 ; Max = 1,000 ; Increments by 25**

*This value tells the marquee how many tickets to start with. The default is 100 and can be set to 5,000.*

**Option 2: Default = 1 ; Min = 1 ; Max = 100 ; Increments by 1**

*This value tells the marquee how many games before incrementing the tickets. Default is 1.*

**Option 3: Default = 1 ; Min = 1 ; Max = 100 ; Increments by 1**

*This value tells the marquee how many games before taking 100 points off the score. Default is 1.*

**Option 4: Default = 500 ; Min = 25 ; Max = 1,000 ; Increments by 25**

*This value sets the maximum amount of tickets it can pay. Default value is 500 and can be set up to 5,000.*

**Option 5: Default = 0 ; Min = 0 ; Max = 10 ; Increments by 1**

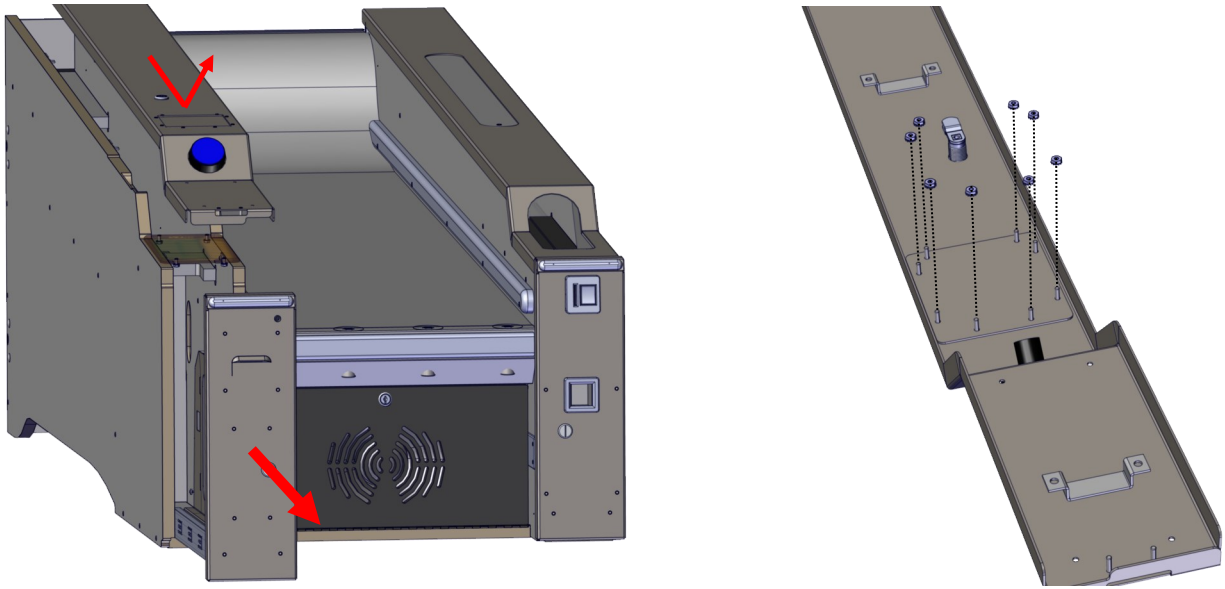
*This value tells the marquee how many tickets to add when incrementing.*

For Example:

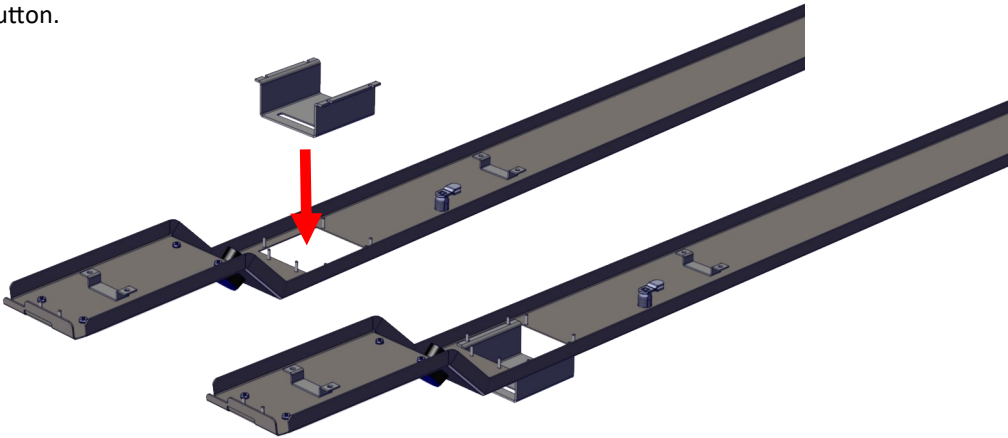
When the player finishes their game if the score is less than the score shown on the marquee it will add one ticket (if option 2 is set to 1 and option 5 is set to 1) to the ticket win and subtract 100 points off the score to beat (if option 3 is set to 1). When the player beats the score, the marquee will revert to the values stored in option 0 and 1. Option 4 will limit the maximum amount the tickets to win can go.

# Dollar Bill Validator Install Instructions

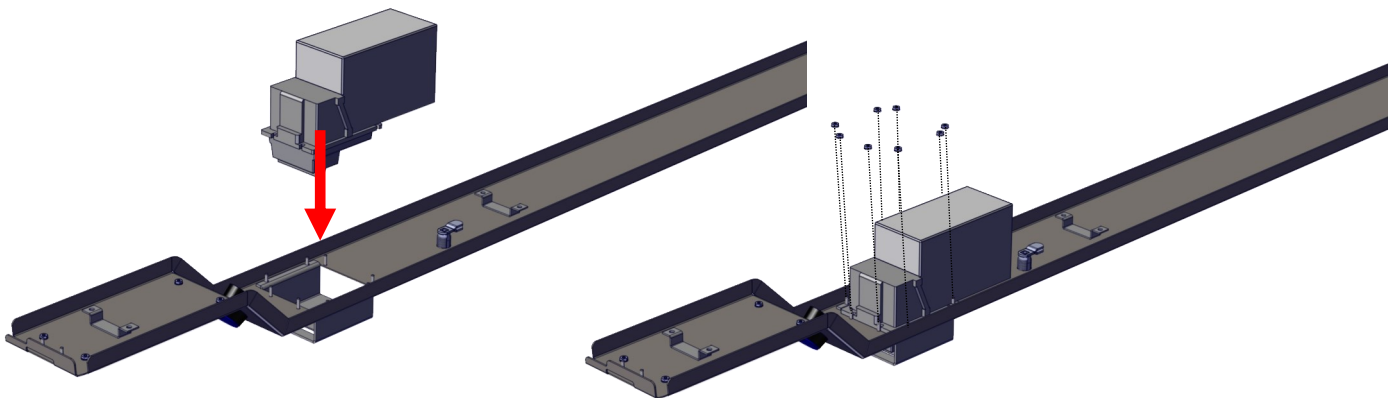
Unlock the left ball rail cover and ticket drawer. Slide the ticket drawer open and slide the left cover forward and up. Lay it on the center of the alley upside down. Remove the eight nuts holding the DBV cover on and put aside. You will reuse the nuts.



Located in your cash box is a clear plastic cover. Remove the protective paper and insert it into the ball rail with the slot end toward the start button.

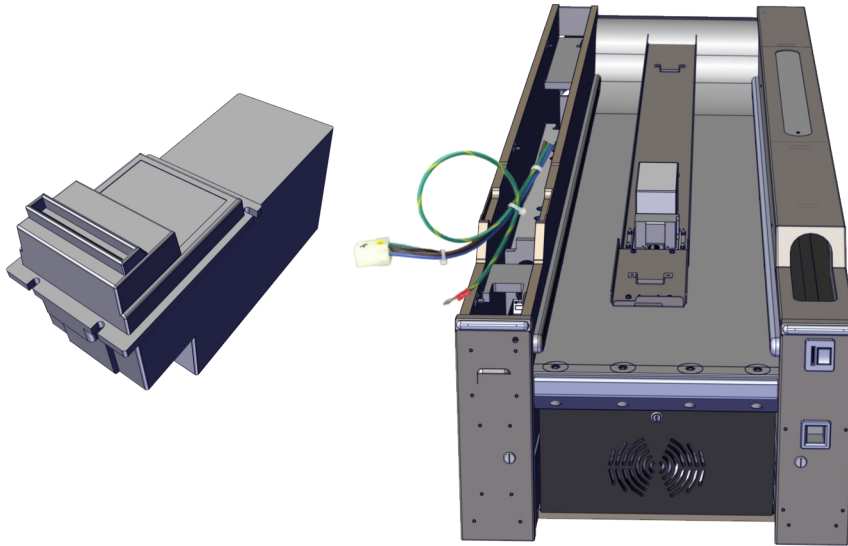


Attach the DBV onto the cover using the eight nuts you removed prior.



## Dollar Bill Validator Install Instructions Continued

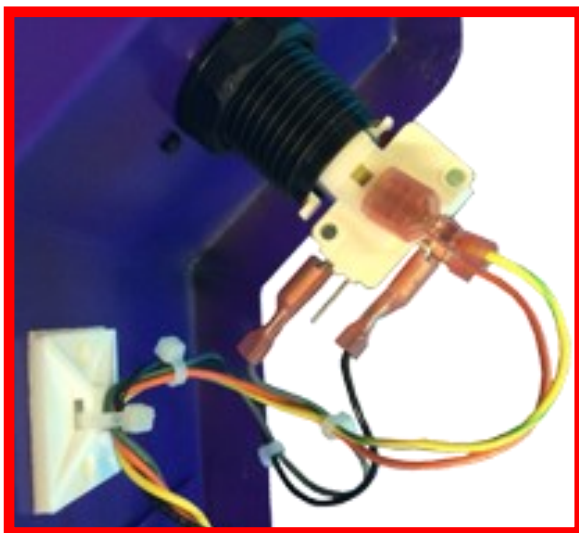
The bill validator harness is zip tied to the main harnessing running down the side of the cabinet. Carefully cut the zip tie and attach the harness to the dollar bill validator.



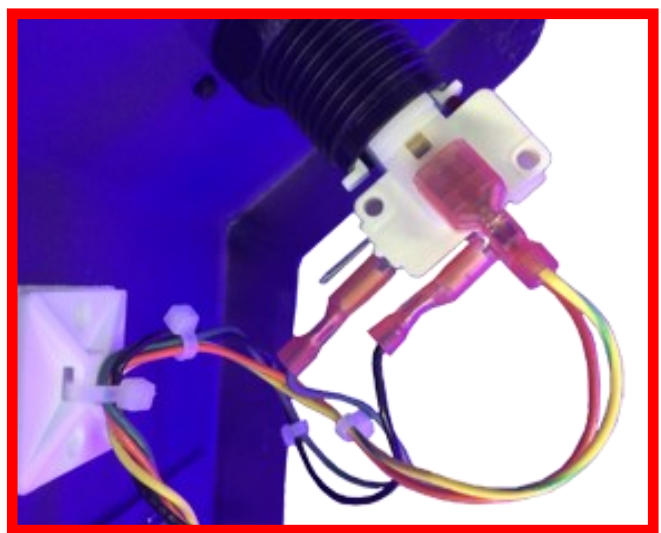
The last step to install your dollar bill validator is to configure it for the FX game. It should be set so that for every dollar inserted, it will pulse the game four times (4 pulses = \$1 inserted). The pulse length should be set to "long".

## Coin Discounting

If you plan on using Coin Discounting you will need to modify the start button wiring connection. It is normally wired closed so that you do not need to press the start button to begin a game. Open the left ticket drawer and slide the rail cover up and out. Flip the cover over and move the grey with blue strip wire from the NC connection to the NO connection. See the pictures below.



Normally Closed connection  
(Standard)



Normally Open connection  
(Coin Discounting)

To enter program mode for the game, press the “program” button during attract mode. Pressing the “program” button during game play will be ignored. To cycle through the different options use the “select” button and to change the values of the options use the “advance” button. Exit programming by pressing the “program” button.

Located on the main board are push buttons labeled SW2, SW3, SW4, SW5, and SW6. SW2 switch is the Program button. SW3 switch is the Select button and SW4 switch is the Advance button.

### Alley Roller FX Revision 4.0

Option	Default	Min	Max	Inc	Description
0 Game Volume	3	0	7	1	Game volume.
1 Coin 1	1	0	9	1	Cost of game.
2 Discount	0	0	9	1	# of games till discount. 0 = disabled.
3 Games Per Credit	1	1	9	1	# of games given per game credit.
4 Balls Per Play	9	1	20	1	Balls dispensed per game.
5 Attract Time	0	0	30	1	Attract time in minutes.
6 Tickets to Pay	10	1	50	1	To determine tickets paid out, take the points scored and divide by this value times 100. IE: $24000 \text{ pts} / (10 \times 100) = 24 \text{ tickets}$ . 10 is default.
7 JFP	4	0	20	1	Just for Playing Tickets.
8 Ticket Cap	0	0	50	1	Max Tickets Given per game, 0 = disabled.
9 Ticket Override	1	0	2	1	A setting of 0 disables tickets. A setting of 1 is normal. A setting of 2 is half tickets out.
10 Theme On	1	0	1	1	Whenever music Plays 0 = Off, 1= on
11 Factory Reset	0	0	1	1	Factory Reset

#### \*\* NOTES \*\*

If the solenoid will not fire because the zero count sensor is blocked than the decimal point in the left balls digit will light indicating the reason for the solenoid to not open.

If the game is out of tickets, then "tic" will be displayed on the score until the tickets have been reloaded and paying out. Should a player insert money then the game will continue as normal until the end of the game where the out of tickets display will be redisplayed.

Game ID 1 is the controlling game for the RGB lighting. A single non-linked game should be set to ID 1. If linked than one game, and only 1 game shall be set to ID 1. The ID of the RGB system is 13 so no game ID should be set to 13.

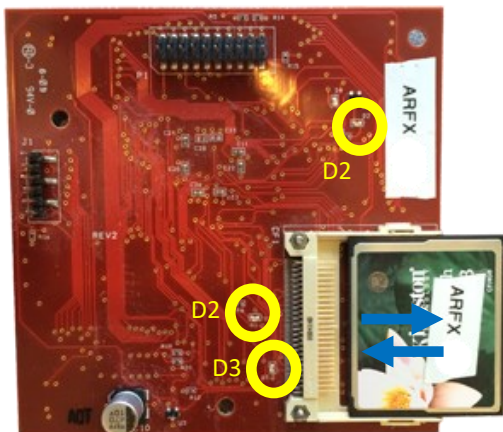
# ERROR Codes

Error #	Description
1	Bad or missing Compact Flash Card (Occurs on power up)
2	Zero Count Sensor Error - Check for Balls in Sensor (Occurs only on power up)
3	Sensor 1K (Occurs only on power up)
4	Sensor 2K (Occurs only on power up)
5	Sensor 3K (Occurs only on power up)
6	Sensor 4K (Occurs only on power up)
7	Sensor Left 10K (Occurs only on power up)
8	Sensor Right 10K (Occurs only on power up)
9	Ball Count Sensor Error (Occurs only on power up)
10	Coin 1 Stuck Down (when does it occur)
11	Ticket Error
12	Solenoid Seat Sensor (Occurs only on power up)
FULL	The solenoid will not activate if the zero count sensor is blocked. (Occurs anytime)
SOL	The solenoid is activated but has not reached its end of travel. (Occurs during game play)
TIC	Game owes tickets and is out of tickets. (Occurs during game play)

## Description and Possible Solutions For Error Codes

### Error 1

No Compact flash card detected. This can be caused by either a corrupted compact flash card, failed compact flash card, or hardware failure on the CPU board. If another machine is available, swap the two compact flash cards then the CPU boards to see if the problem follows. If the problem follows, then the problem is the card. If you have only one game, try these steps:



**Step 1:** Reseat Compact Flash card — With the power off, pull out the compact flash card and then push it back in. Turn power back on.

**Step 2:** Look at D2 on the CPU board, is the LED light on constant or is it blinking? If it is blinking, then it is reading the compact flash card. If the light is constant, it cannot read the compact flash card. Replace the CF card.

**Step 3:** Look at D3 and D2, are they on? If not, D3 is the +5 voltage which is used by the compact flash. D2 is the 3.3 voltage used by the IC's of the CPU board. Replace the CPU board if no power indicators are not on.

Step 4: In rare cases, the CPU board can have D2 and D3 on but still be bad.

## Resolving Error 2 :

This sensor detects the balls that are returned back to the ball rail assembly. It works by emitting a beam of light across where the balls travel back into the ball rail assembly. When the beam is broken the sensor detects the loss of the beam and sends a signal back to the main board. When working properly, D2 LED will only light when the beam is blocked.

Follow these trouble shooting steps:

**STEP 1:** Remove the right cover and look at the back of the ball rail channel. You will find a sensor embedded into the cabinet sides.

**STEP 2:** Observe the status of LED D2 located on the left side. Is the LED On constant? If not, go to step 3. If so, then it is possible D1 LED is not emitting a beam. You cannot see this beam with your eyes. If you have a cell phone with a camera option, point your phone at D1 on the Transmitter board in camera mode. If it doesn't blind the camera then the IRLED has gone bad. At this point replacement is recommended. NOTE: Some hires cameras will filter out the IRLED light, use forward camera mode instead.

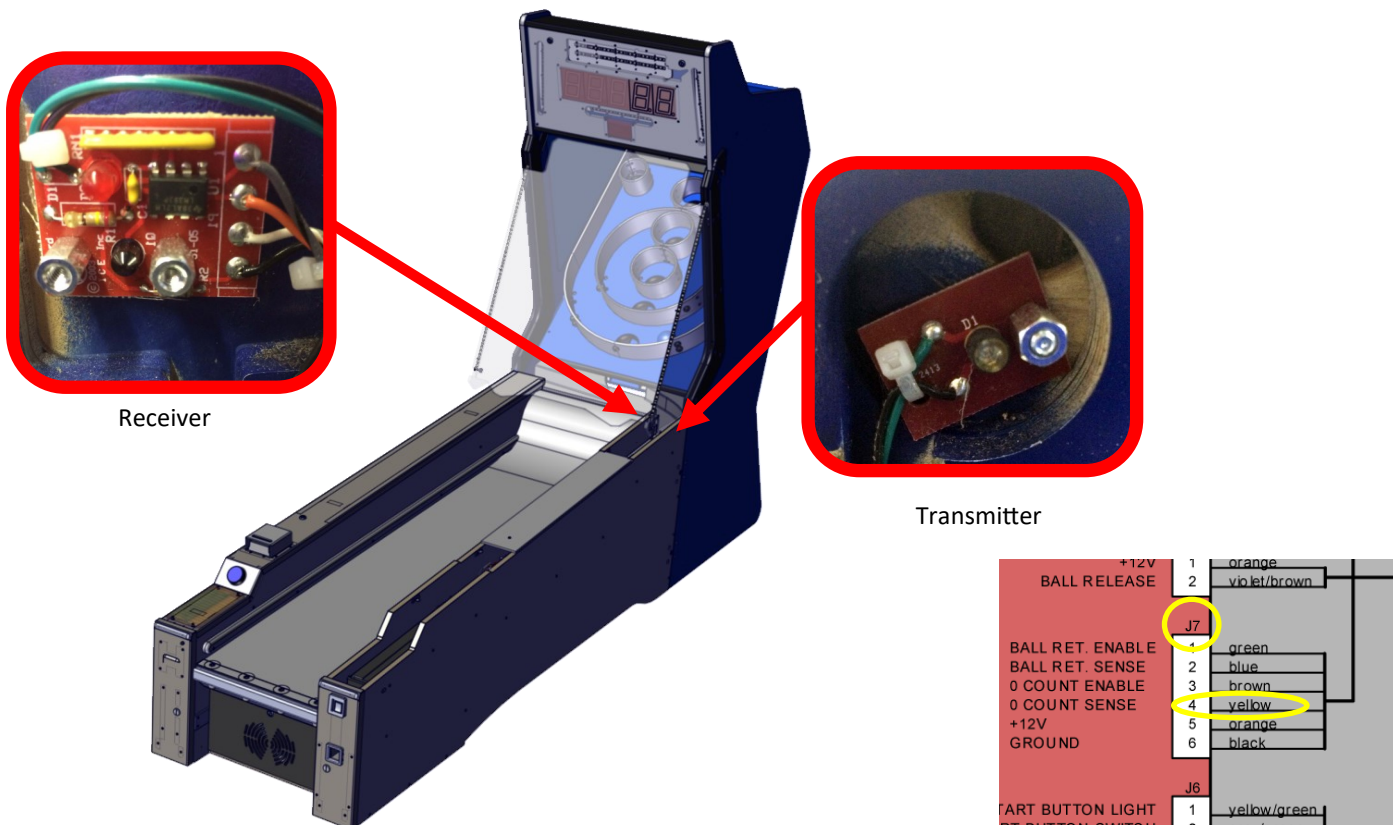
**Step 3:** Place your hand between the emitter board and receiver board. Did the LED D2 light? If not, using a volt meter set to DC place the red probe on pin 2 of the sensor and place the black probe on pin 4 of the sensor. Is there +12 volts? If not you have a broken connection either in ground or power from the sensor back to the main board.

**Step 4:** Measure the white with grey strip wire connected to the receiver with your volt meter set to DC voltage. Is there around 5 volts present? If so, is there still voltage on this wire when you block the sensor? If yes, then replace the sensor.

**Step 5:** Measure the enable line to ensure the sensor is being turned on. Place the red probe on pin 2 of the sensor and the black probe on pin 1. Is there pulsing 12 volts of DC? If not, you have a connection problem between the main board and sensor.

**Step 6:** Check the voltage on pin 4 of connector J7 on the main board (the yellow wire). Is there around +5 volts when the sensor is not blocked? If yes does it drop to about nothing when blocked? If yes, replace the main board assembly.

**Step 7:** If no voltage exists at Pin 4 double check the connector between the sensor itself and the game's harnessing. It will require you to separate the front and back cabinet parts to access the sensor's pigtail harness.



Receiver

Transmitter

+12V	1	orange
BALL RELEASE	2	violet/brown
	J7	
BALL RET. ENABLE	1	green
BALL RET. SENSE	2	blue
0 COUNT ENABLE	3	brown
0 COUNT SENSE	4	yellow
+12V	5	orange
GROUND	6	black
	J6	
PART BUTTON LIGHT	1	yellow/green
PART BUTTON SWITCH	2	grey/green

## Resolving Error 3 through 6:

These sensors detect the balls that drop through the lower score holes on the playfield. It works by emitting a beam of light across the hole. When the beam is broken by the ball the sensor detects the loss of the beam and sends a signal back to the main board. When working properly, D2 LED will only light when the beam is blocked or during the enable check.

Follow these troubleshooting steps:

**STEP 1:** Open the Playfield's plastic front door and secure it in the up position. Lift the playfield up and secure it in the open position.

**STEP 2:** Refer to the score sensor error number below to determine the location of the failed sensor. Observe the status of LED D2 located on the receiver side (Right-side). Is the LED On constant? If not go to step 3. If so, then it is possible D1 LED is not emitting a beam. You cannot see this beam with your eyes. If you have a cell phone with a camera option, point your phone at D1 on the transmitter board in camera mode. If it doesn't blind the camera then either the IRLED has gone bad or it is not being enabled. At this point replacement is recommended. NOTE: Some hires cameras will filter out the IRLED light, use forward camera mode instead.

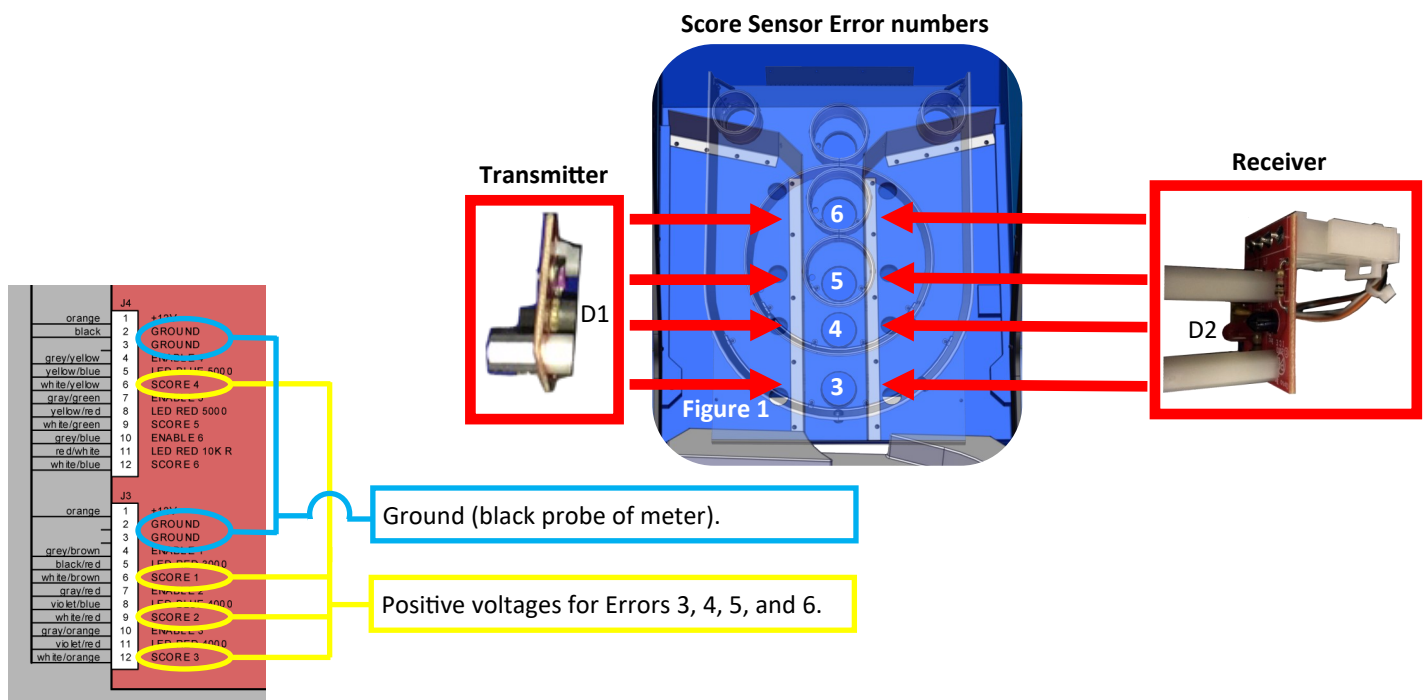
**Step 3:** Place your hand between the emitter board and receiver board. Did the LED D2 light? If not, using a volt meter set to DC place the red probe on pin 2 of the sensor and place the black probe on pin 4 of the sensor. Is there +12 volts? If not you have a broken connection either in ground or power from the sensor back to the main board.

**Step 4:** Looking at the wiring schematic insert, identify the color wire for pin 3 of the failed sensor. Each sensor in the schematic insert has been labeled by its error number and score value. Measure this wire with your volt meter set to DC voltage. Is there around 5 volts present? If so, then is there still voltage on this wire when you block the sensor? If yes, then replace the sensor.

**Step 5:** Measure the enable line to ensure the sensor is being turned on. Place the red probe on pin 2 of the sensor and the black probe on pin 1. Is there pulsing 12 volts of DC? If not, you have a connection problem between the main board and sensor.

**Step 6:** Check the voltage on pin 6 of connector J3 for Error 3, pin 9 of connector J3 for Error 4, pin 12 of connector J3 for Error 5, and pin 6 of connector J4 on the main board. Is there around +5 volts when the sensor is not blocked? If yes does it drop to about nothing when blocked? If yes, replace the main board assembly.

**Step 7:** If no voltage exists at the Pin double check any connector that is between the sensor itself and the game's main board. It might require you to separate the front and back cabinet parts to access all the wiring.



## Resolving Error 7 and 8:

These sensors detect the balls that drop through the upper score holes on the playfield. They score the 10K points. When both sensors are activated the game will give a 5k score. The sensor works by emitting a beam of light across the hole. When the beam is broken by the ball the sensor detects the loss of the beam and sends a signal back to the main board. When working properly, D2 LED will only light when the beam is blocked or during enable sequence.

Follow these trouble shooting steps:

**STEP 1:** Open the Playfield's plastic front door and secure it in the up position. Lift the playfield up and secure it in the open position.

**STEP 2:** Refer to the score sensor error number (Figure 2 below) to determine the location of the failed sensor. Observe the status of LED D2 located on the receiver side (See figure 3 on the next page). Is the LED On constant? If not go to step 3. If so, then it is possible D1 LED is not emitting a beam. You cannot see this beam with your eyes. If you have a cell phone with a camera option, point your phone at D1 on the transmitter board in camera mode. If it doesn't blind the camera then either the IRLED has gone bad. At this point replacement is recommended. NOTE: Some hires cameras will filter out the IRLED light, use forward camera mode instead.

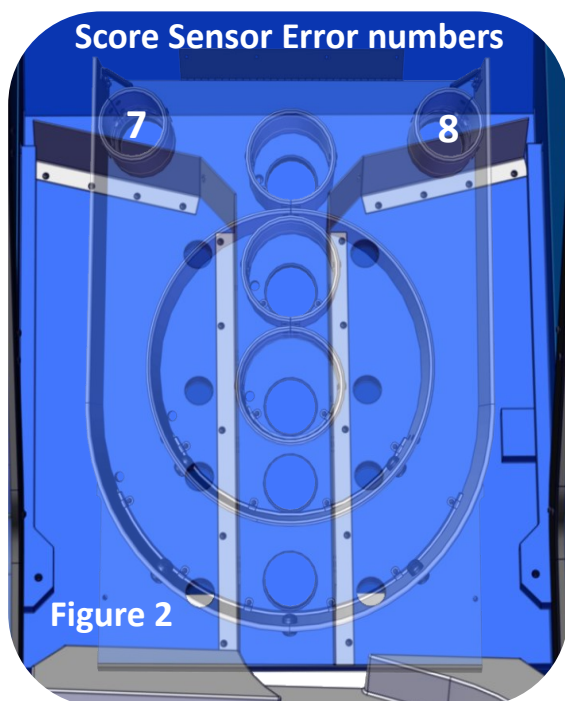
**Step 3:** Place your hand between the emitter board and receiver board. Did the LED D2 light? If not, using a volt meter set to DC place the red probe on pin 2 of the sensor and place the black probe on pin 4 of the sensor. Is there +12 volts? If not you have a broken connection either in ground or power from the sensor back to the main board.

**Step 4:** Looking at the wiring schematic insert, identify the color wire for pin 3 of the failed sensor. Each sensor in the schematic insert has been labeled by its error number and score value. Measure this wire with your volt meter set to DC voltage. Is there around 5 volts present? If so then is there still voltage on this wire when you block the sensor? If yes, then replace the sensor.

**Step 5:** Measure the enable line to ensure the sensor is being turned on. Place the red probe on pin 2 of the sensor and the black probe on pin 1. Is there pulsing 12 volts of DC? If not, you have a connection problem between the main board and sensor.

**Step 6:** Check the voltage on pin 9 of connector J4 for Error 6 and pin 12 of connector J4 for Error 7 on the main board (See figure 4). Is there around +5 volts when the sensor is not blocked? If yes does it drop to about nothing when blocked? If yes, replace the main board assembly.

**Step 7:** If no voltage exists at the Pin double check any connector that is between the sensor itself and the game's main board. It might require you to separate the front and back cabinet parts to access all the wiring.





# Resolving Error 7 and 8 Continued:

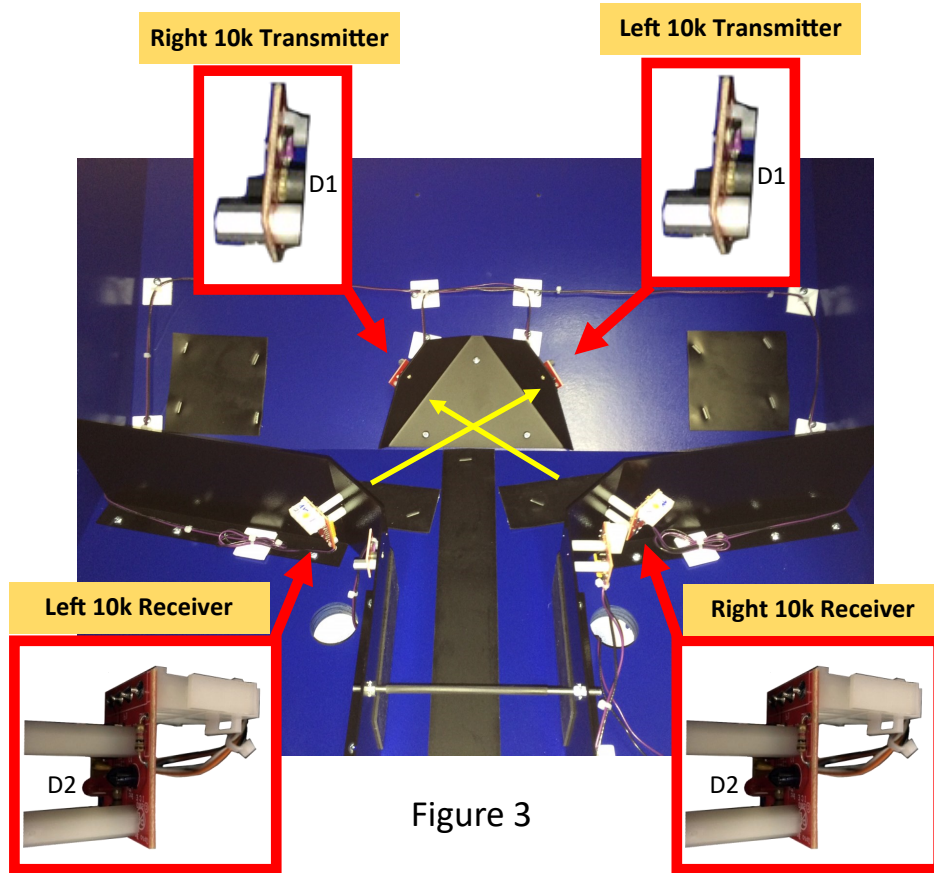


Figure 3

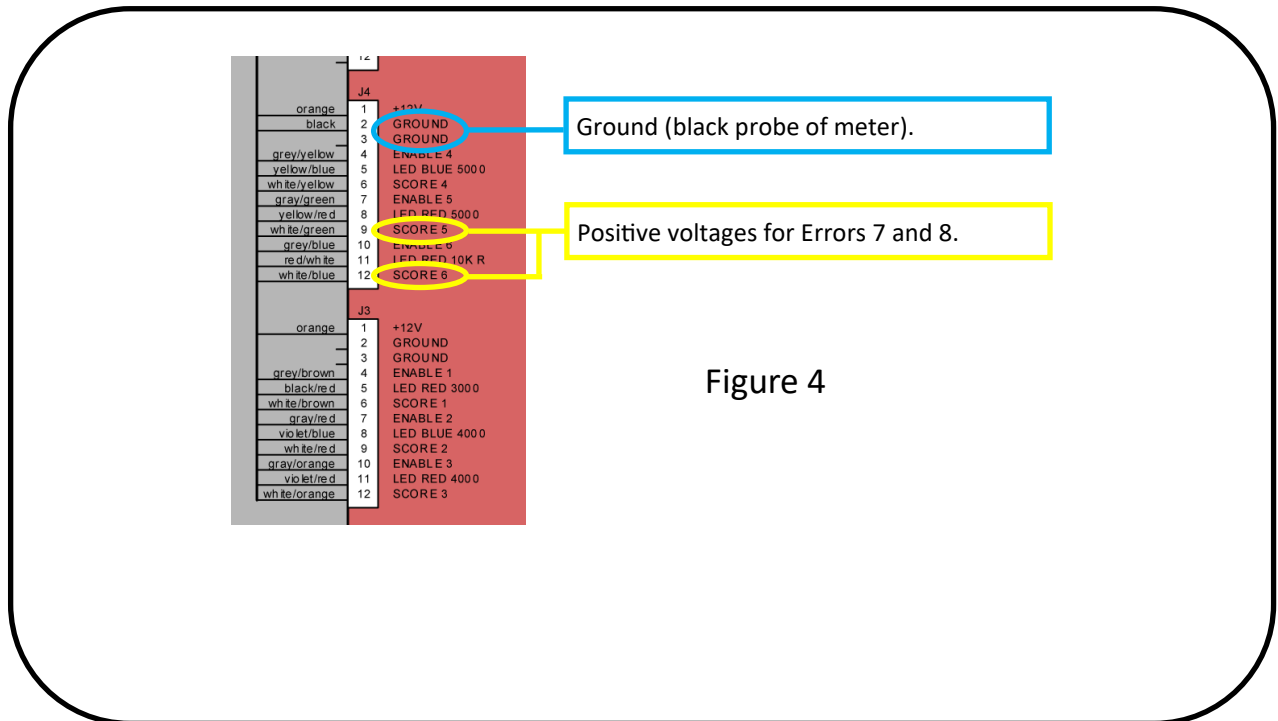


Figure 4

## Resolving Error 9:

This sensor detects the balls that exit the ball rail assembly. The sensor works by emitting a beam of light across the path where the balls exit. When the beam is broken by the ball the sensor detects the loss of the beam and sends a signal back to the main board. When working properly, D2 LED will only light when the beam is blocked.

Follow these trouble shooting steps:

**STEP 1:** Remove the right cover and look at the back of the ball rail channel. The sensor is located in front of the solenoid. See Figure 5.

**STEP 2:** Observe the status of LED D2 located on the receiver side (See figure 5). Is the LED On constant? If not go to step 3. If so, then it is possible D1 LED is not emitting a beam. You cannot see this beam with your eyes. If you have a cell phone with a camera option, point your phone at D1 on the transmitter board in camera mode. If it doesn't blind the camera then either the IRLED has gone bad or it is not being enabled. At this point replacement is recommended.

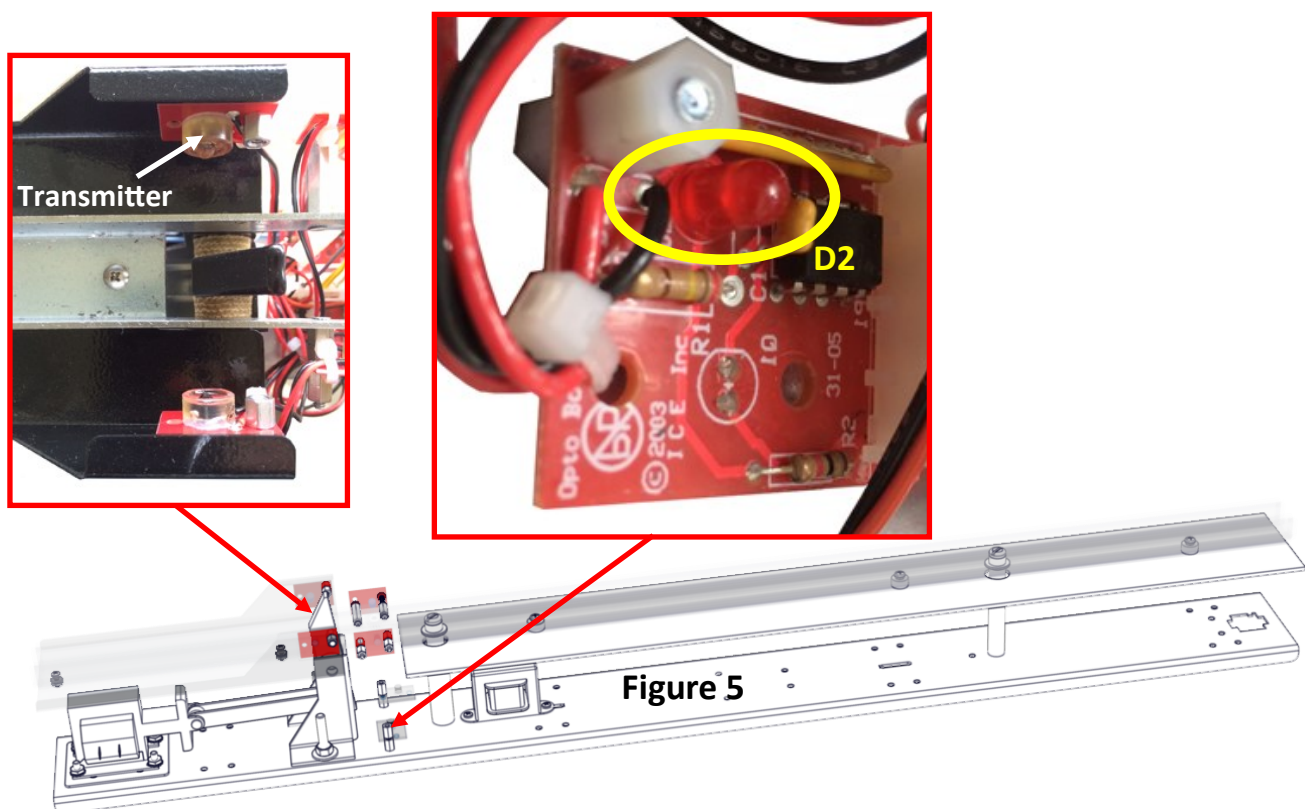
**STEP 3:** Place your hand between the emitter board and receiver board. Did the LED D2 light? If not, using a volt meter set to DC place the red probe on pin 2 of the sensor and place the black probe on pin 4 of the sensor. Is there +12 volts? If not you have a broken connection either in ground or power from the sensor back to the main board.

**STEP 4:** Measure the red wire (see Figure 5) with your volt meter set to DC voltage. Is there around 5 volts present? If so then is there still voltage on this wire when you block the sensor? If yes, then replace the sensor.

**STEP 5:** Measure the enable line to ensure the sensor is being turned on. Place the red probe on pin 2 of the sensor and the black probe on pin 1. Is there pulsing 12 volts of DC? If not, you have a connection problem between the main board and sensor.

**STEP 6:** Check the voltage on pin 2 of connector J7 on the main board (the blue wire). Is there around +5 volts when the sensor is not blocked? If yes does it drop to about nothing when blocked? If yes, replace the main board assembly.

**STEP 7:** If no voltage exists at Pin 2 double check the connections between the sensor itself and the game's harnessing.



## Resolving Error 10:

This error occurs when the Coin line is shorted to ground.

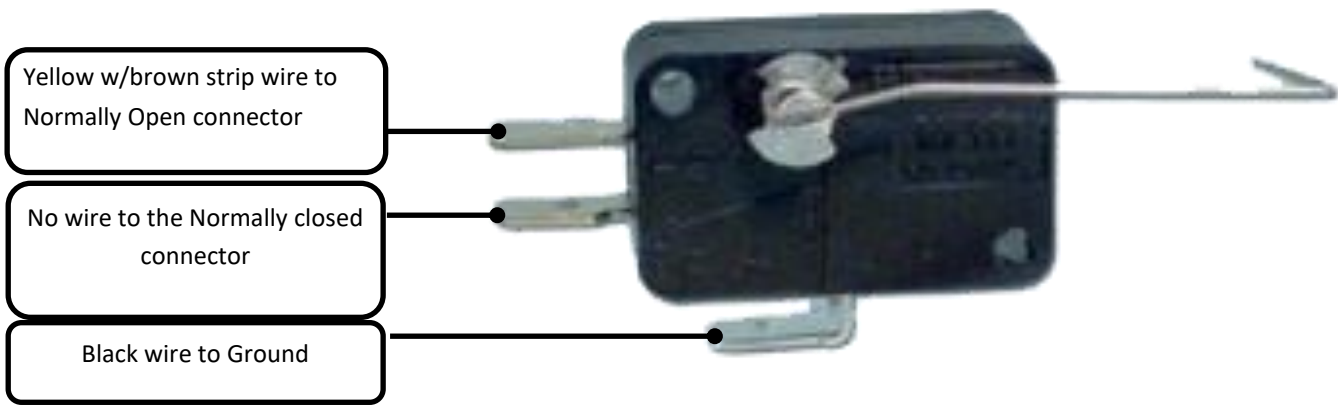
Follow these trouble shooting steps:

**STEP 1:** Slide the coin drawer open and inspect the coin switch. Is the yellow w/brown strip wire and the black wire connected as shown below? If not, correct it.

**STEP 2:** With a volt meter set to DC voltage, place the red probe to the yellow w/brown strip wire and place the black probe to the black wire. Is there voltage present. If yes, skip Step 3. You have an open connection from the main board to the switch.

**Step 3:** Unplug J9 on the main board. Did the error clear? If so, you have a shorted wire harness going to the coin switch or DBV harness coin switch, or a defective DBV unit. Find the short or replace the DBV unit.

**Step 4:** With the volt meter, check Pin 2 of J9 (with J9 still unplugged) with the red probe and Pin 1 of J9 with the black probe for +5 volts DC. If missing replace the main board assembly.



## Resolving Error 11:

This can be a result of either the ticket dispenser having no tickets, defective ticket dispenser, broken wire, or bad main board assembly. Follow these trouble shooting steps:

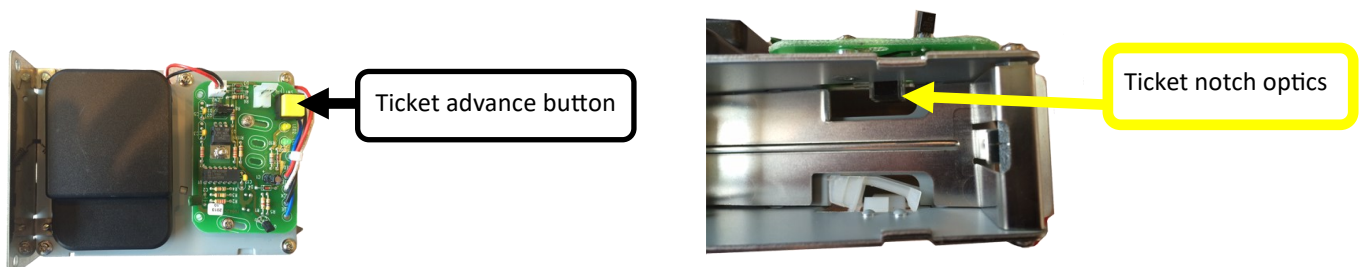
**STEP 1:** Slide the ticket drawer open and check for tickets. Load tickets into the ticket dispenser if empty.

**STEP 2:** With a meter set to DC voltage place the red probe to the violet/blue wire and touch the black probe to the black wire on the ticket dispenser. Press the ticket advance button to dispense a ticket. Is there voltage while a ticket blocks the ticket notch optics? If yes, skip Step 3. Move the red probe to pin 4 of the ticket dispenser (red wire). Is there +12 volts present? If not, you have an open connection from the ticket dispenser and main board.

**Step 3:** Before you replace the ticket dispenser check the ticket notch optics for debris. If no debris are found, then replace.

**Step 4:** With a volt meter, check Pin 1 of J8 with the red probe on the main board assembly and Pin 1 of J9 with the black probe on the main board assembly for +5 volts of DC each time a ticket is dispensed. If no voltage (pulse) is present as tickets are dispensed, then the harness from the ticket dispenser to the main board is bad.

**Step 5:** Replace the main board assembly.



## Resolving Error 12:

This sensor detects when the solenoid has fully pushed the ball release lever down. The sensor works by emitting a beam of light across where the ball release lever is fully down. When the beam is broken by the lever the sensor detects the loss of the beam and sends a signal back to the main board. When working properly, D2 LED will only light when the beam is blocked.

Follow these troubleshooting steps:

**STEP 1:** Remove the right cover and look where the solenoid is on the ball rail assembly. The sensor is located in back of the solenoid. See Figure 6.

**STEP 2:** Observe the status of LED D2 located on the receiver side (See figure 6). Is the LED On constant? If not go to step 3. If so, then it is possible D1 LED is not emitting a beam. You cannot see this beam with your eyes. If you have a cell phone with a camera option, point your phone at D1 on the transmitter board in camera mode. If it doesn't blind the camera then either the IRLED has gone bad or it is not being enabled. At this point replacement is recommended.

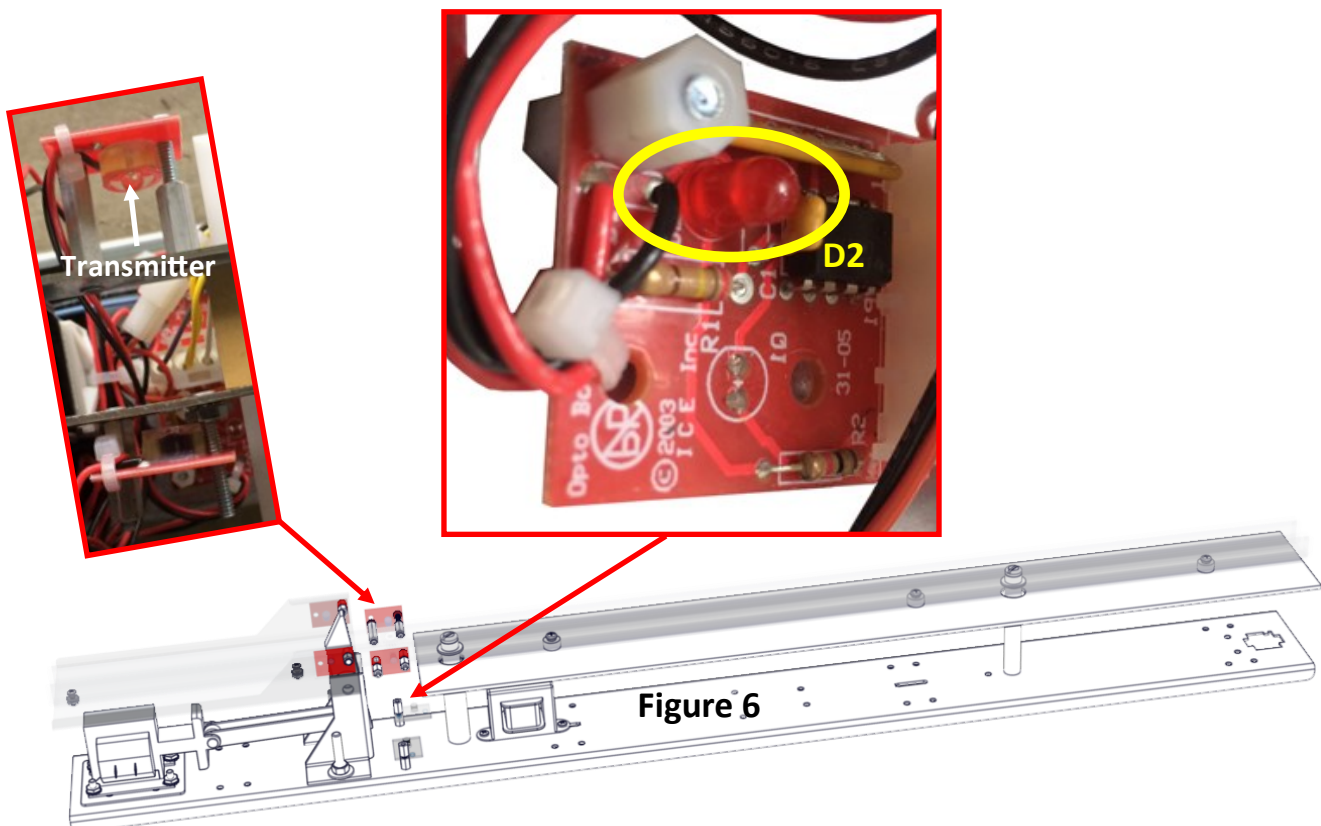
**STEP 3:** Place your hand between the emitter board and receiver board. Did the LED D2 light? If not, using a volt meter set to DC place the red probe on pin 2 of the sensor and place the black probe on pin 4 of the sensor. Is there +12 volts? If not you have a broken connection either in ground or power from the sensor back to the main board.

**STEP 4:** Measure the white wire (see Figure 6) with your volt meter set to DC voltage. Is there around 5 volts present? If so then is there still voltage on this wire when you block the sensor? If yes, then replace the sensor.

**Step 5:** Measure the enable line to ensure the sensor is being turned on. Place the red probe on pin 2 of the sensor and the black probe on pin 1. Is there pulsing 12 volts of DC? If not, you have a connection problem between the main board and sensor.

**STEP 6:** Check the voltage on pin 6 of connector J5 on the main board (the white wire). Is there around +5 volts when the sensor is not blocked? If yes does it drop to about nothing when blocked? If yes, see solenoid troubleshooting to continue.

**STEP 7:** If no voltage exists at Pin 6 double check the connections between the sensor itself and the game's harnessing.



## Resolving Error FULL:

The game will display the word "FULL" on the score display and not dispense any balls. This occurs when the 0 count sensor is blocked or defective. If more than 15 balls are used in the game, the balls will back up and block the 0 count sensor.

Follow these trouble shooting steps:

**STEP 1:** Visually inspect for balls protruding out the ball rail assembly back onto the playfield. If more than 9 balls are present, it is recommended to remove them from play.

**STEP 2:** If no balls are blocking the 0 count sensor see previous section "Resolving Error 2".

## Resolving Error SOL:

The game will display the word "SOL" on the score display and not dispense any balls if it doesn't see the SOL sensor being activated. This will occur when the solenoid cannot fully engage and block the SOL sensor. It can be caused by either the solenoid over heating, physically blocked, wiring, bad relay board, or bad main board assembly.

Follow these trouble shooting steps:

**STEP 1:** Remove the ball rail cover and see if there is any foreign objects is blocking the ball release lever from moving. If so, remove.

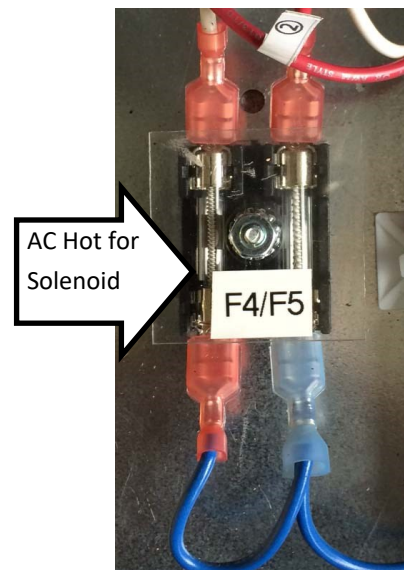
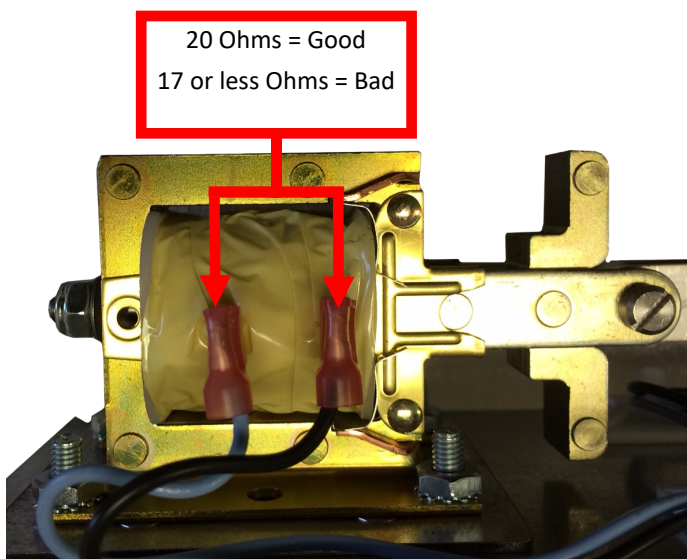
**STEP 2:** If more than 12 balls are in the ball rail assembly, remove the balls in rail assembly. Lift the ball rail out and place your hand on the solenoid. If the solenoid is hot, allow it to cool down.

**STEP 3:** With a meter set to ohms, measure the solenoid's resistance. It should read around 20 ohms. If the resistance is higher, it has been thermally damaged, replace.

**STEP 4:** If less than 17 ohms, replace and continue to Step 5.

**STEP 5:** Turn the game power off. Slide the main board assembly tray open and with your meter measure the fuse at F4. If opened, replace with same type.

**STEP 6:** Replace ball rail assembly and turn the game power back on. If the game now shows error 12 see "Resolving Solenoid Issues" and not Resolving Error 12.



## Resolving Solenoid Issues:

**\*\* WARNING \*\*** You will be measuring 110 Volts of AC power. Only a qualified technician should continue following these steps.

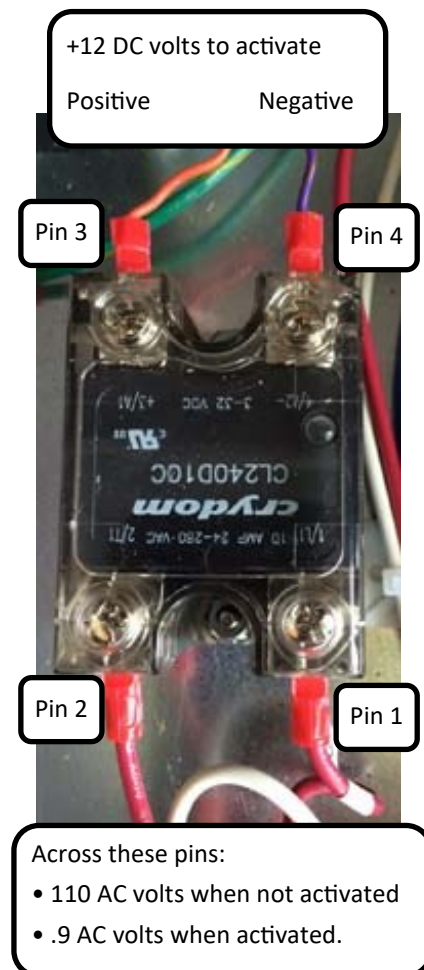
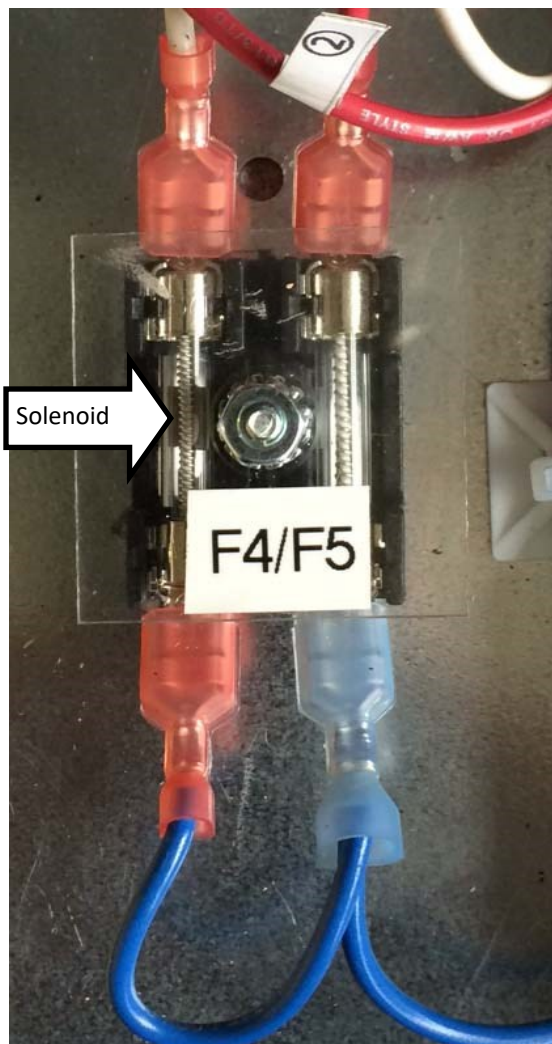
If you have an error 12 on power up but the SOL sensor tests fine and all wiring has been confirmed to the SOL sensor then follow these steps:

**Step 1:** Using a volt meter set to DC voltages put the red probe on Pin 3 (+) and the black probe on Pin 4 (-). The wires have labels stating their pin connections. Now start a game. Did the meter read +12 volts? If so, switch your volt meter to AC voltage. Move the black probe to Pin 1 of the relay. Move the red probe to pin 2 of the relay. Is there 110v of AC voltage? Start a game. Did the voltage drop to hardly nothing? If not, go to step 4.

**Step 2:** If there was no +12 of DC voltage present across Pins 3 and 4 of the relay, put the red probe on pin 1 of J18 on the main board assembly and the black probe on pin 2 of J18 on the main board assembly. Is there +12 volts now? If not, replace the main board assembly. If so, carefully check the wiring for damage or connection issues.

**Step 3:** If no 110V of AC was present at pins 1 and 2 then check the fuse at F4. If open then replace with same type and re-test.

**Step 4:** If the 110 of AC voltage didn't drop to hardly nothing, replace the relay.



# Resolving LED Issues

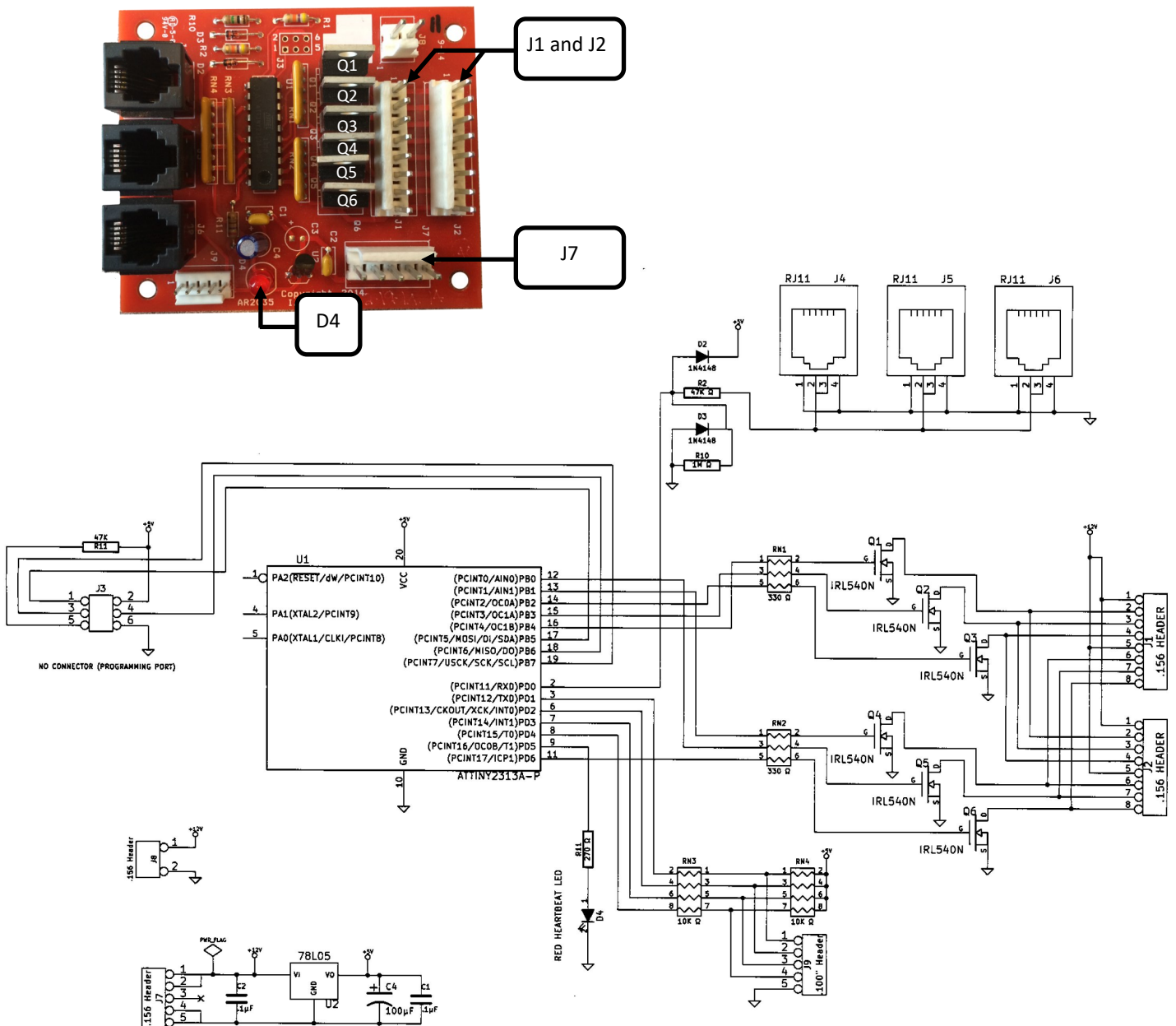
All the LEDs are controlled by the AR2035X LED controller board located behind the score display of each lane. When the games are successfully linked the LEDs across all of the lanes will flash the same color sequence. The red led on location D4 should have a constant rapid flash, if the led is slowly flashing it is an indication that the boards are not communicating.

All of the phone jacks on the controller board are on a parallel circuit. If you suspect you have a bad jack you can move it to another to verify.

If you have no LED lighting at all check the power on connector J7, it is the input power. Take your red probe and place it on either pins 1 or 2. Now take your black probe and put it on either pins 4 or 5. Your meter should read +12 volts of DC power.

J1 and J2 connectors are the outputs to the LEDs on the game/marquee. Pins 1 and 5 on J1 and J2 have +12 volts of DC always present. The grounds for the LED output are switched on and off by transistors. So you need to place your black probe on J7, pin 4 or 5 to read the voltage. Both J1 and J2 connectors have the same pin outs and are interchangeable. J2 controls the side glass led strips normally and J1 controls the lane led strips normally.

The led strips are driven by the IRL540N transistors at locations Q1- Q6. Q1 controls the red LEDs on pin 2 of both J1 and J2. Q2 controls the green LEDs on pin 3 of both J1 and J2. Q3 controls the blue LEDs on pin 4 of both J1 and J2. Q4 controls the red LEDs on pin 7 of both J1 and J2. Q5 controls the green LEDs on pin 8 of both J1 and J2. Q6 controls the blue LEDs on pin 9 of both J1 and J2. You can short the color drive lines to ground and the corresponding color will light.

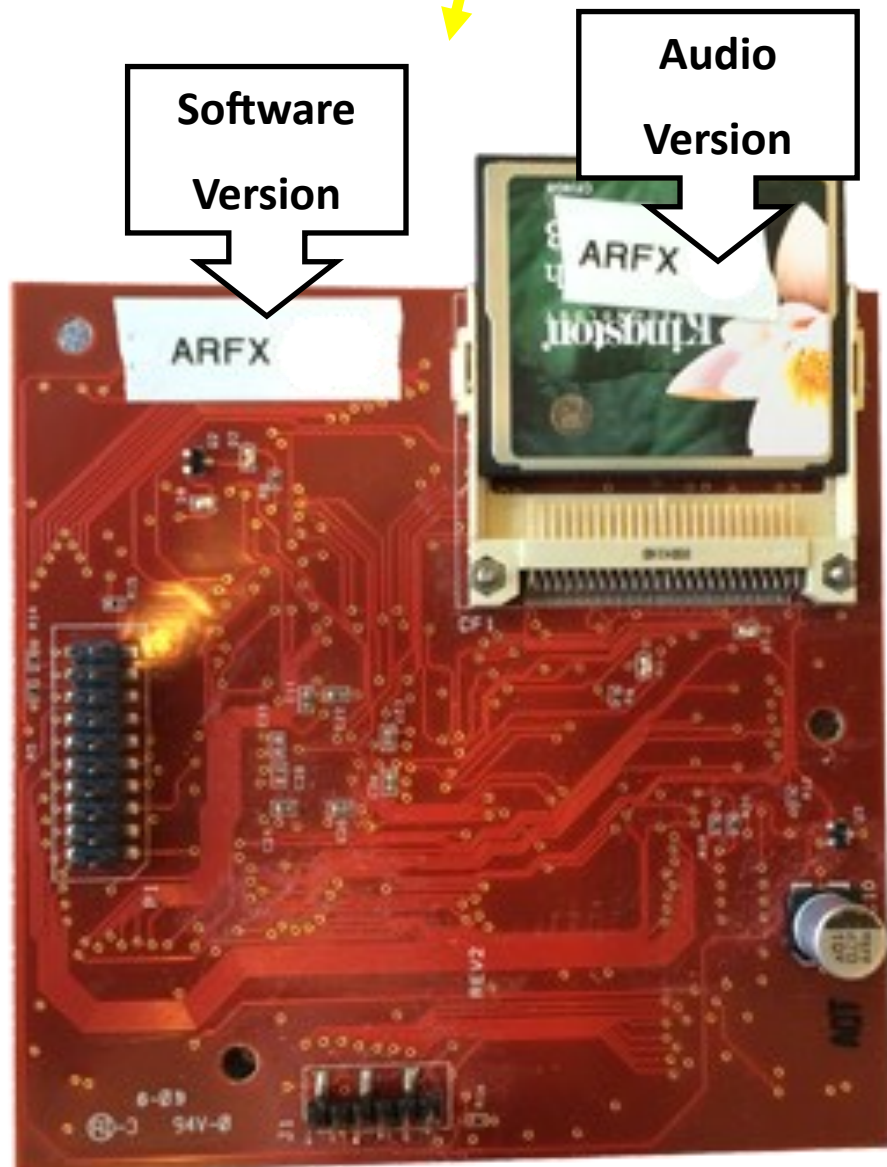
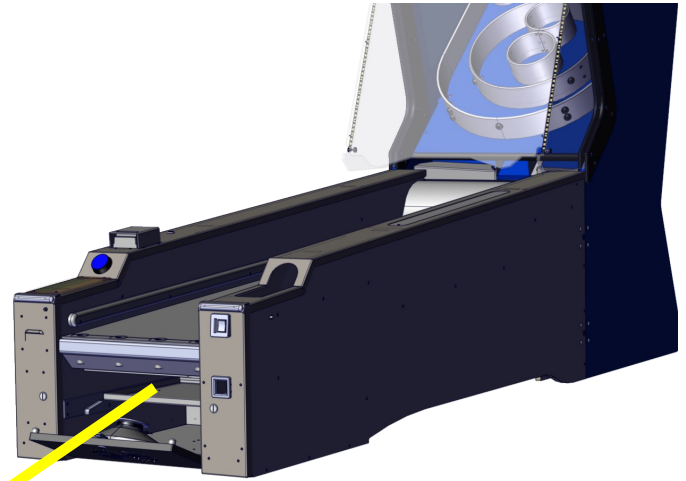


## How to Identify the Version Numbers for Your Game

The CPU board is plugged onto the I/O board which is mounted on a drawer accessed through the front of the game. Open the bottom door and slide the electronics' tray out.

There you will find the software and audio versions labeled.

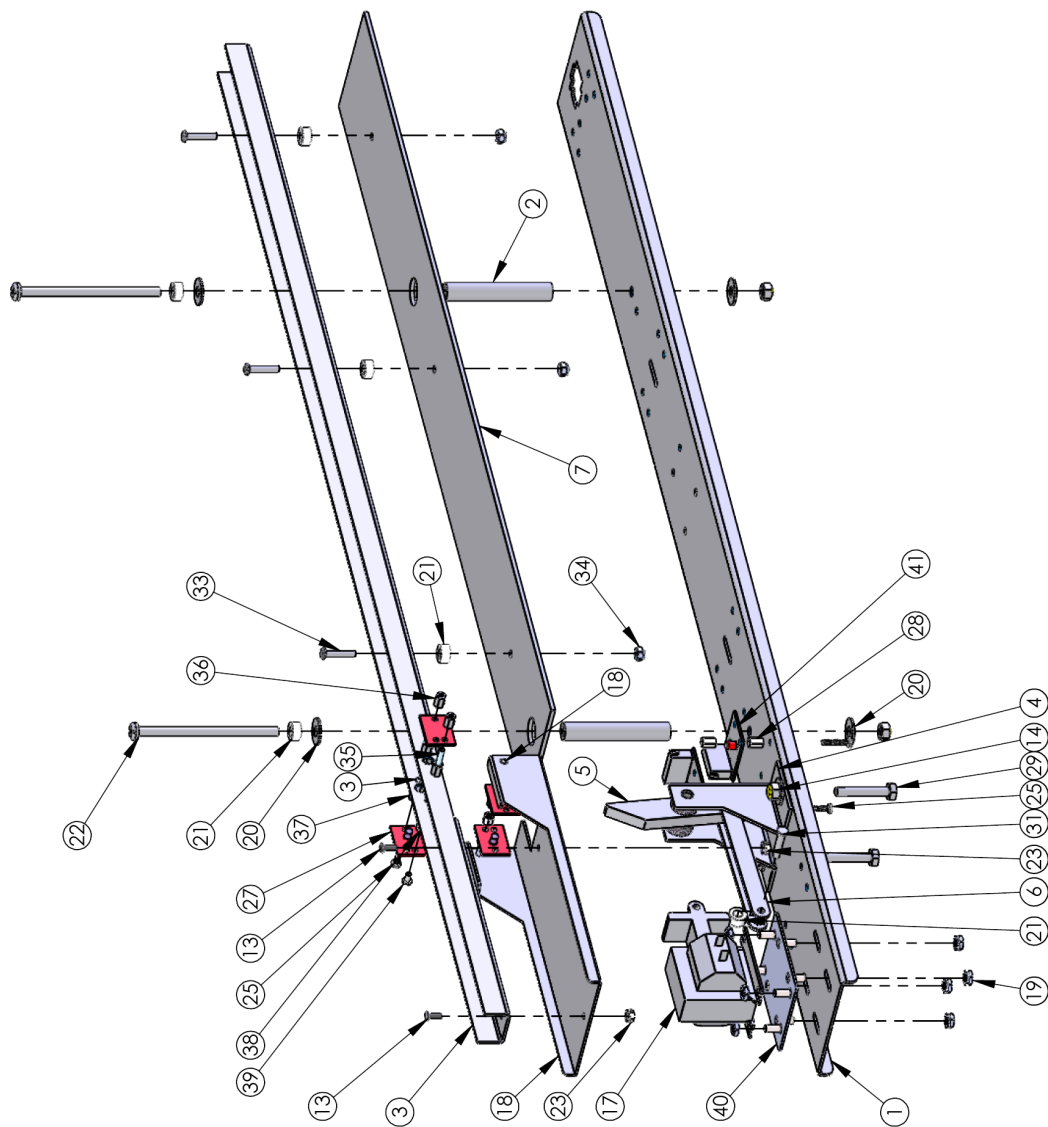
The game will also display the version at the top on power up.

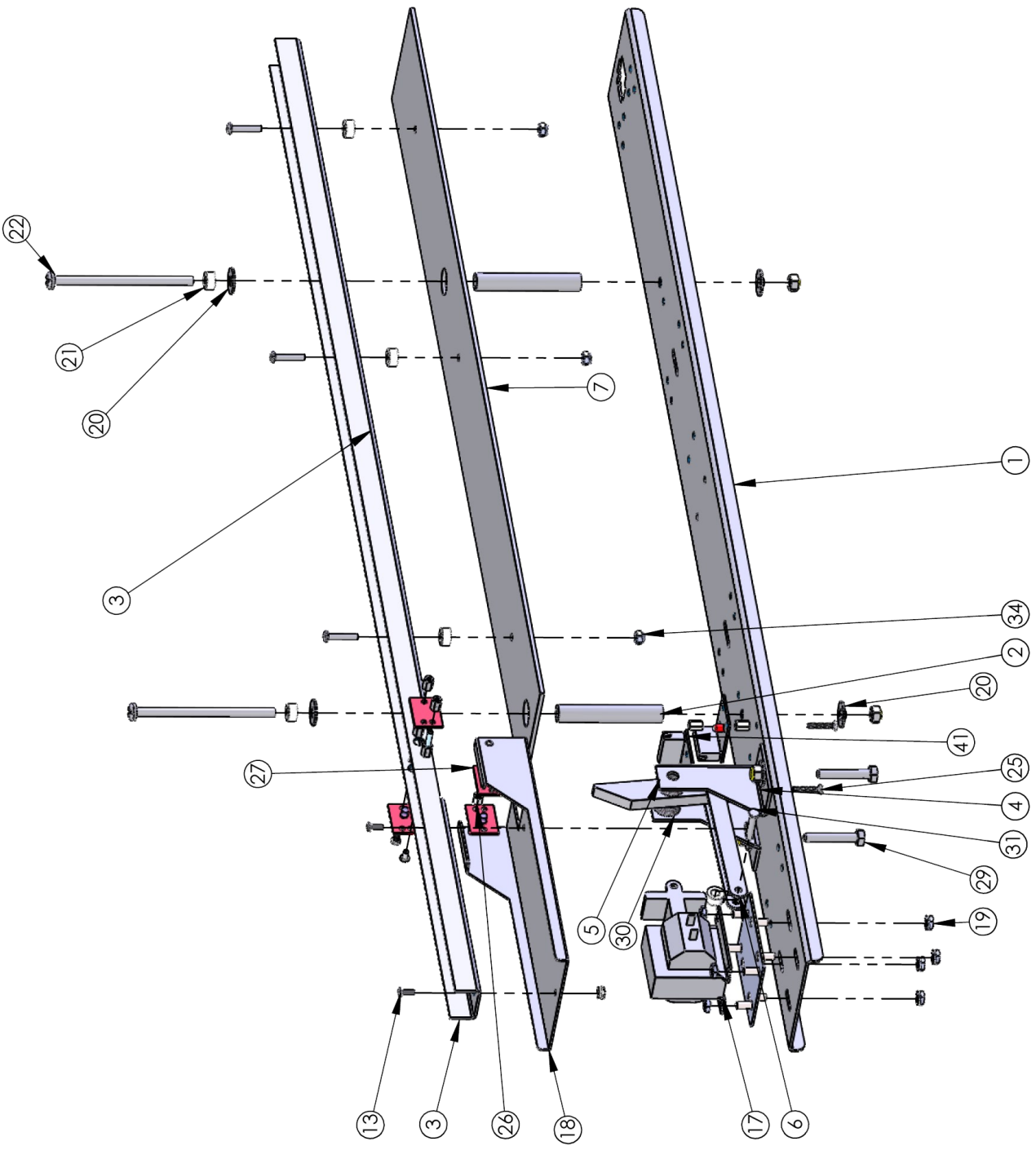




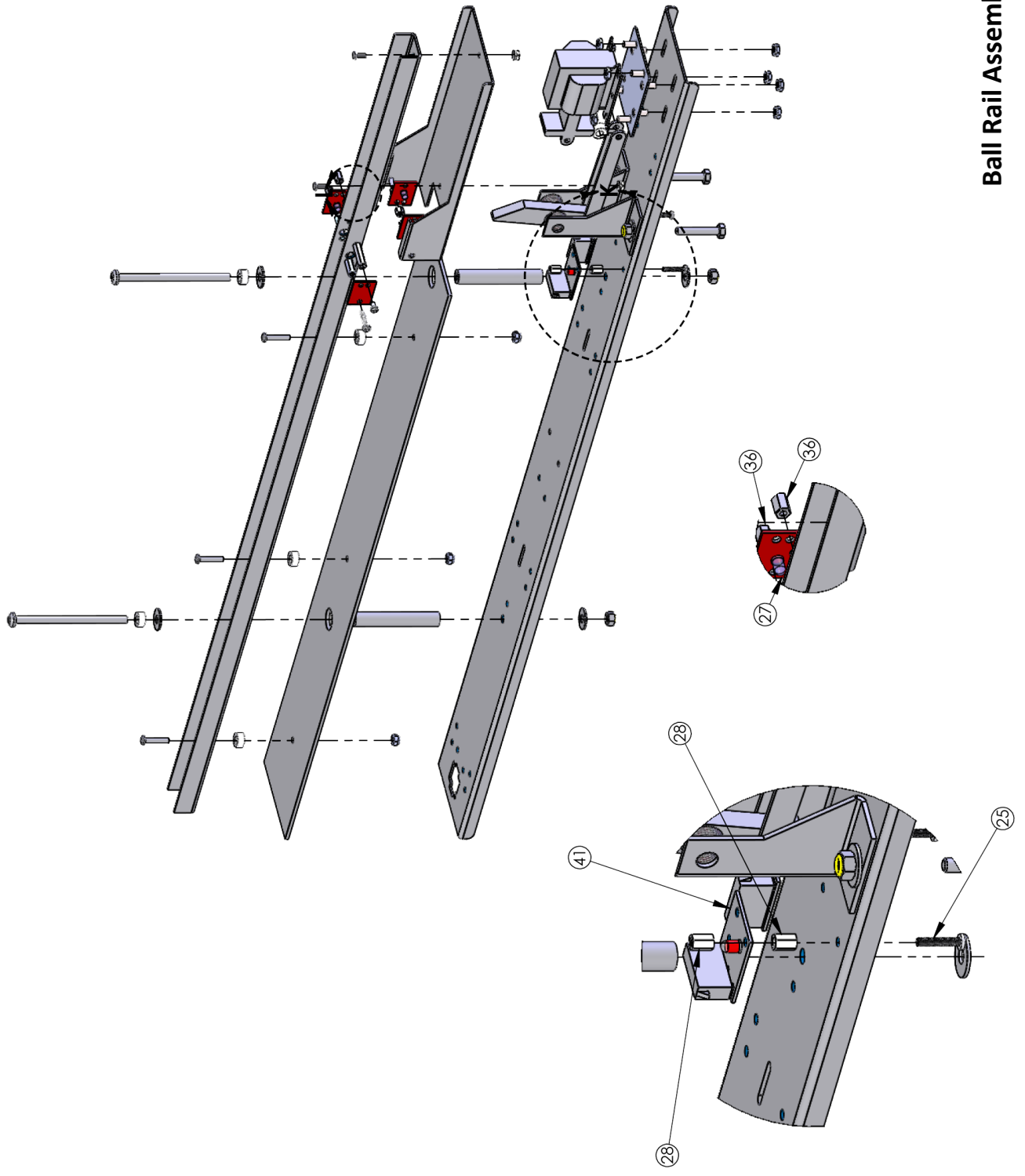
# Ball Rail Assembly AR1409X 1 of 4

PART NUMBER	DESCRIPTION	QTY.
7	AR1002	1
1	BALL RETURN TRAY	1
2	AR1003	2
2	RAIL SUPPORT SPACER	2
3	AR1001	1
3	BALL RAIL	1
4	AR1009	1
4	BALL RELEASE LEVER BRACKET	1
5	AR1018	1
5	BALL RELEASE LEVER	1
6	AR1007	2
6	SOLENOID LINKAGE	2
7	AR3008	1
7	PL7 LIGHT DIFFUSER	1
8	AR2017	1
8	DIFFUSER SUPPORT	1
9	251	1
9	PL7 SOCKET	1
10	249	1
10	PL7 BULB	1
11	248C	1
11	PL7 TRANSFORMER	1
12	6068	2
12	8-32 x 3/8 PHMS	2
13	6183	4
13	6-32 X .375 LONG (SS)	4
14	PC60604	5
14	NYLOCK NUT, 1/4-20	5
15	CC3016	1
15	RUBBER WASHER	1
16	CC2016	1
16	3/4-16 JAM NUT	1
17	AR2408X	1
17	SOLENOID	1
18	RB1010	1
18	BRACKET (BALL RELEASE SENSOR)	1
19	6040	8
19	10-24 KEP NUT	8
20	6075	6
20	1/4 x 3/4 FLAT WASHER ZINC (USS)	6
21	6305	6
21	SPACER, NYLON 1/2x.260x1/4L	6
22	PC60617	2
22	1/4-20 X 4.0" LG SLOTTED PAN HEAD	2
23	SK624	2
23	6-32 KEP NUT	2
24	6225	4
24	6-32 x .5 PEM STUD	4
25	6073	3
25	6-32 X 3/4 PHMS	3
26	PC60643	4
26	6-32 x 1/4 HH SPACER	4
27	RB2009CX part of 41	4
27	RECEIVER	4
28	PC60642	4
28	6-32 x 3/8 HH SPACER 14HTSP007	4
29	6124	2
29	1/4-20 X 1.5" LG HH BOLT	2
30	6111	2
30	FIBER WASHER	2
31	6118	1
31	3/16 x 1" CLEVIS PIN	1
32	6117	1
32	3/16 x 3/4" CLEVIS PIN	1
33	6155	3
33	8-32x7/8 PHMS	3
34	6072	3
34	8-32 NYLOCK NUT	3
35	6419	2
35	6-32 x 1 PEM STUD (FH-632-16Z)	2
36	640	4
36	6-32 x 1/2" HH METAL SPACER	4
37	91780A129	1
38	6127	1
38	6-32 x 1 HH METAL SPACER	1
39	CR-FHMS 0.138-32x0.25x0.25-N	1
40	AR1143	1
40	SOLENOID MOUNTING PLATE	1
41	RB2009CX part of 27	2
41	PC88 (RED) OPTO SENSE	2

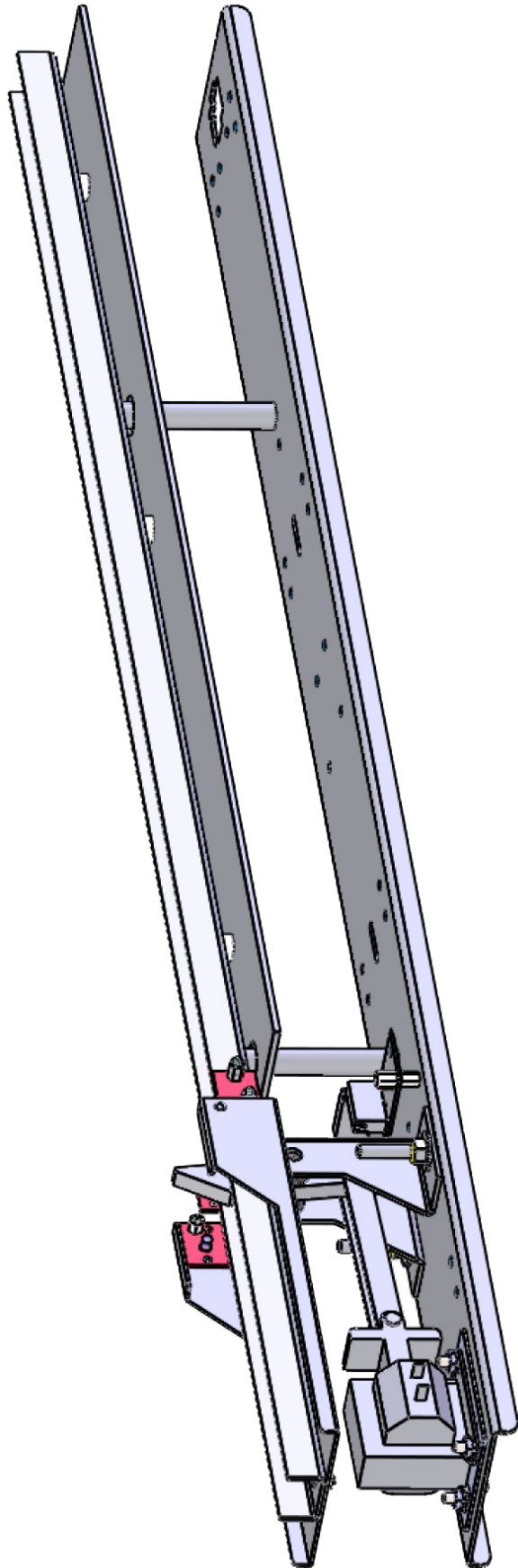




Ball Rail Assembly AR1409X 2 of 4



Ball Rail Assembly AR1409X 3 of 4



# Spare Parts list

AR1406-P601X	COIN DOOR ASY
AR1408-P601X	TICKET DOOR ASY
AR1409X	ASY (BALL RELEASE LEVER) FX
AR1411-P601	CHANNEL COVER LEFT
AR1412-P601	CHANNEL COVER RIGHT
AR1413-P601	BLANK PLATE
AR1419-P802	ALLEY ROLLER EDGE PROTECTOR
AR2005	BUTTON LG RD BLUE START
AR2007	SPEAKER (ROHS) (6X9) U694 W/ .
AR2010	POWER SUPPLY +12VDC 17A (ROHS)
AR2035X	LED DRIVER BOARD
AR2452EMX	HARNESS (COIN DOOR W/DBV INTERFA
AR2453ELX	HARNESS (TICKET DOOR EXTENSION)
AR2460LX	HARNESS (CONTROLLER POWER)
AR2462LX	HARNESS (LED POWER SUPPLY AC)
AR2463MX	HARNESS (AC/BALL RAIL EXTENSION)
AR2480MX	HARNESS (PLAYFIELD/PLAYER SCORE
AR2482HX	HARNESS (PLAYFIELD LEDS)
AR2492ELX	HARNESS (ALLEY RGB LED EXTENSION
AR2492LX	HARNESS (ALLEY RGB LED)
AR2493LX	HARNESS (GLASS LED POWER)
AR3005	BALL COVER WINDOW
AR3021	HOP STOPPER (USES PC60626)
AR3024	BALL 3" WHITE (POLYPROPYLENE)
AR3069X	BALL DIVERTER ASY (W/WOOD)
AR3100X	RUNWAY ASY GRAY (PEBBLE)
AR3425X	TARGET AREA ASSEMBLY (FX)
AR3436	BALL CHANNEL RAIL
AR3489	SIDE GLASS
AR3495	FRONT GLASS
AR7440	SCORE CHART INSERT (\$0.25)
AR7441	SCORE CHART INSERT (\$0.50)
AR7442	SCORE CHART INSERT (\$1)
BA2063LX	HARNESS (MONITOR SUPPLY AC)
DA1023NAX	ASY (MAIN BOARD TRAY)
DD2007X	ASY (POWER MODULE 3AMP)
E00049	LED T3 1/4 WEDGE BASE 12VDC 3
E00724ARBX	ASY (45 RGB LED TAPE STRIP)
E00724ARCX	ASY (54 RGB LED TAPE STRIP)
E00724ARDX	ASY (219 RGB LED TAPE STRIP)
NA2051X	HARNESS (START BUTTON)
NA2068X	HARNESS (DISPLAY HEADER EXTENS
NA2069X	HARNESS (DISPLAY HEADER)
RB2009DX	PCBA (OPTO SENSE POINT ZERO) A
RB2009X	PCBA (OPTO SENSE POINT 10K)
RB2055X	HARNESS (PLAYFIELD)
RB3180CX	BALL RAMP ASY (3 ACROSS, AR CL



# WARRANTY POLICY

I.C.E. Inc warrants all components in new machines to be free of defects in materials and workmanship for the period listed below:

- 180 days on Main PCB's, Computers & Motors
- 1 year on all LCD monitor panels
- 90 days on all other electronic and mechanical components
- 30 days on all I.C.E. repairs and parts purchases

I.C.E. Inc shall not be obligated to furnish a warranty request under the following conditions:

- Equipment or parts have failed through normal wear and tear
- Equipment has been subjected to unwarranted stress, abuse or neglect
- Equipment has been damaged as a result of arbitrary repair/modification

Products will only be covered under warranty by obtaining an I.C.E. authorized RMA #. To obtain an RMA # please provide I.C.E. tech support with the game serial # or original I.C.E. invoice # and a detailed description of the failure or fault symptoms.

I.C.E. Inc will assume no liability whatsoever for costs associated with labor or travel time to replace defective parts. All defective warranty covered components will be replaced with new or factory refurbished components equal to OEM specifications.

I.C.E. Inc will cover domestic UPS ground, or comparable shipping costs during the warranty period. International or expedited shipments are available for an additional charge. To obtain credit defective parts must be returned to I.C.E. Inc, at the customer's expense, within 30 days. After 30 days a 15% re-stocking fee will apply to all returns.

ICE distributors are independent, privately owned and operated. In their judgment, they may sell parts and/or accessories other than those manufactured by I.C.E. Inc. We cannot be responsible for the quality, suitability or safety of any non-I.C.E. part or modification (including labor) that is performed by such a distributor.

Innovative Concepts in Entertainment

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**Clarence, NY 14031**

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